USSR

GOLOVCHENKO, YU. M., et al., Radiatsion. fiz. tverd. tela i reaktornoye materialoved., Moscow, Atomizdat Press, 1970, pp 185-191

defects of the third type are not annealed. At a test temperature of 20°, σ_B is lowered with an increase in burn-up. This lowering is sharper for an irradiation temperature up to 360°. There are 3 illustrations and a 5-entry bibliography.

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1/2 035 UNCLASSIFIED PROCESSING DATE--23OCT7(

TITLE--MECHANICAL PROPERTIES OF IRRADIATED URANIUM -U-

AUTHOR-(04)-VOROBYEV, M.A., GOLOVCHENKO, YU.M., DAVIDENKO, A.S., BYCHKOV, B.A.

COUNTRY OF INFO--USSR

SOURCE--AT. ENERG. 1970, 28(2), 107-11

DATE PUBLISHED-------70

SUBJECT AREAS--NUCLEAR SCIENCE AND TECHNOLOGY, CHEMISTRY, MATERIALS

TOPIC TAGS--MECHANICAL PROPERTY, URANIUM, IRRADIATION, TENSILE STRENGTH

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1997/1561 STEP NO--UR/0089/70/028/002/0107/0111

CIRC ACCESSION NO--AP0120340

UNCLASSIFIED

2/2 035 UNCLASSIFIED

CIRC ACCESSION NO--AP0120340 PROCESSING DATE--23OCT7

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TENSILE STRENGTH OF U SAMPLES IRRADIATED TO 0.09-0.4PERCENT BURNUP AT 250-450DEGREES DECREASES WITH INCREASING BURNUP, IN PARTICULAR FOR SAMPLES IRRADIATED AT 250-360DEGREES; E.G., THE STRENGTH OF SAMPLES IRRADIATED TO GREATER THA 0.3PERCENT BURNUP MAY BE LESS THAN 10 KG-MM PRIME2, WHILE THAT OF NONIRRADIATED SAMPLES IS 60-70 KG-MM PRIME2. THE COMPRESSIVE STRENGTH OF IRRADIATED SAMPLES AT ROOM AND ELEVATED TEMPS. IS HIGHER THAN THAT O NONIRRADIATED SAMPLES. THE IRRADN. REDUCES THE FATIGUE RESISTANCE OF U E.G., IN A STD. TEST (AT ROOM TEMP.) UNDER A LOAD OF 12-15 KG-MM PRIME2 THE NO. OF CYCLES TO FAILURE RANGED FROM 1 TIMES 10 PRIME4 TO 4.5 TIMES 10 PRIME5 FOR IRRADIATED SAMPLES AND FROM 1.5 TIMES 10 PRIME6 TO 3.1 TIMES 10 PRIME6 FOR NONIRRADIATED SAMPLES.

UNCLASSIFIED

USSR

UDC 546.183 + 546.22

VOROB'YEV, M. D., FILATOV, A. S., and ENGLIN, M. A.

"Reaction of Phosphorus Trichloride With Difluorides of Perfluoroalkylimines of Sulfur and Some of its Fluoroinorganic Compounds"

Leningrad, Zhurnal Obshchey Khimii, Vol 42 (104), No 9, Sep 72, pp 1942-1944

Abstract: The reaction of phosphorus trichloride with the difluorides of sulfur perfluoroalkylimines and some inorganic fluorinated sulfur compounds was investigated. It was established that the halogen exchange is accompanied by oxidation-reduction reactions. When phosphorus oxychloride was used -- the reaction mixture had to be heated to 150° or more. Sulfur hexafluoride appeared to be completely inert, failing to react with PCl_3 even at 180°C.

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USSR

VOROB'YEV, M.D.

UDC 621.385.032.21:537.53

"Study Of The Dependence Of Low-Frequency Noise Diodes With Impregnated Cathodes On The Anode Current"

Tr. Mosk. energ. in-ta (Works Of Moscow Power Institute), 1972, Issue 108, pp 83-85 (from RZh:Elektronika i yeye primeneniye, No 7, July 1972, Abstract No 7A17)

Translation: The results are presented of a study of the dependence of low-frequency noise on the anode current for diodes with impregnated aluminated cathodes. Before the measurements, the noise was steblized with temperatures and currents close to normal operation during several tens of hours. The effective work function of the cathodes at completion of stabilization amounted to 2.1--2.2 ev. Measurements of the noise of the devices were made in the frequency range of 12--10,000 Hz with various anode currents in a space-charge operation. 3 ref.A.F.

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Acc. Nr. AP0045911 Abstracting Service: 5/70 Ref. Code: UR 3663

INTERNAT. AEROSPACE ABST.

A70-22470 # Experimental determination of the equivalent susceptibility to damage in an alloy EI437B at intermediary service periods for different stress levels under creep conditions (Eksperimental'noe opredelenie ekvivalentnoi povrezhdaemosti splava EI437B pri promezhutochnykh srokakh sluzhby na raznykh urovniakh napriazhenii v usloviiakh polzuchesti). N. A. Vorob'ev (Vsesoiuznyi Institut Legkikh Splavov, Moscow, USSR). *Problemy Prochnosti*, vol. 2, Jan. 1970, p. 91-94. 6 refs. In Russian.

Description of a method for experimental determining the equivalent susceptibility to damage of an alloy EI437B at intermediary service periods and different stress levels under creep conditions at 750 C. As a criterion of the equivalent susceptibility to damage, the identities of the long-time strength curves and the short-time mechanical properties are assumed. Z.W.

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Acs

REEL/FRAME 19780956

18

USSR

UDC 539.4

VOROB'YEV, N. A., and PRONIN, A. T., Moscow, VILS [expansion unavailable, possibly All-Union Institute of Light Alloys]

"Interpretation of the Effect of Structure on the Mechanical Properties of VTZ-1 Alloy"

Kiev, Problemy Prochnosti, No 11, Nov 73, pp 87-90

Abstract: It has been noted earlier by the author that changes of the strength and yield limits of alloys in relation to the structure should be analyzed by means of the Petch [transliterated] equation $\sigma_T = \sigma_0 + k_y (\text{grain size})^{\frac{1}{2}}$, in which the grain size in a laminate structure is the colony size with identical orientation of the plates within the former β-grain, and in a uniaxial structure the size of the α-grains is d. On the basis of the Petch equation an interpretation is given of the relationship of the structure of rolled rods of VTZ-1 titanium alloy with a laminate structure and an equiaxial structure with the mechanical properties of tensile strength, yield, long-term strength, and fatigue. It is shown that the difference in the properties is connected with the different value of parameters σ_0 and k_y in the laminate structure and the equiaxial structure. Four figures, ten references.

1/1

USSR

UDC 539.4

KUDRYASHOV, V. G., PRONIN, A. T., and VOROB'YEV, N. A., All-Union Institute of Light Alloys

"Comparison of the Ductility of Rupture of Titanium Alloys"

Kiev, Problemy Prochnosti, No 2, Feb 74, pp 96-99

Abstract: The ductility of rupture of titanium alloys was determined on the basis of the results of fatigue testing of specimens. The essence of the method used is that a specimen (cylindrical or flat) is fatigue tested to rupture, then the rupture surface is used to determine the length (for the flat specimen) and the depth (for the cylindrical specimen) of the fatigue crack (size of a fatigue spot). Tests were performed at room temperature and elevated temperatures and load-bearing ability (residual strength when cracks are present) was determined. The dimensions of permissible defects (cracks) are calculated for working stresses amounting to 50-100% of the yield point of the material.

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USSR

UDC 539.5

PRONIN, A. T., VOROB'EV, N. A., and MARKOVETS, M. P., Moscow

"Influence of Structure of VT3-1 and VT-18 Alloys on Fatigue Resistance With Asymmetrical Loading Cycle"

Kiev, Problemy Prochnosti, No 4, Apr 72, pp 105-107.

Abstract: Results are presented from fatigue testing of titanium alloys at normal and elevated temperatures with asymmetrical and symmetrical loading. The influence of structure produced by various rolling technologies of bars on cyclical strength of the alloys is determined. This influence differs, depending on the loading conditions. When loading is performed with a pulsating cycle (extension R=0) at room temperature, bars of VT3-1 and VT-18 Alloys with fine-grained equiaxial structure have greater cyclical strength than metals with plate structure. At 450°C with asymmetrical extension with mean stress σ_m=30 kg/mm^2, the fine-grained equiaxial and plate structures are equal; for VT-18 alloy, the plate structure provides a higher resistance to fatigue rupture at 600°C and σ_m=25.0 kg/mm^2.

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USSR

VOROB'YEV, N. F., FEDOSOV, V. P.

"Supersonic Flow around Intersecting Wings"

Aerofiz. Issledovaniya [Aerophysical Studies -- Collection of Works], Novosibirsk, 1972, p 93 (Translated from Referativnyy Zhurnal Mekhanika, No 5, 1973, Abstract No 5B265).

Translation: Supersonic flow is calculated within the framework of linear theory for an arbitrary dihedral angle $0 \leq \gamma \leq 2\pi$, formed by slightly bent intersecting surfaces. The problem is solved using the Walter method of solution of a wave equation. For the case of angle $\gamma = \pi/n$ ($n = 1, 2, 3, \ldots$), the solution is given in quadratures. The solution of the problem in the general case $0 \leq \gamma \leq 2\pi$ is reduced to the solution of integral or integral-differential Walter-type equations, solved by the method of successive approximations. For arbitrary $\pi \leq \gamma \leq 2\pi$, when diffraction phenomena occur, an approximate solution is found in quadratures, which corresponds to the precise solution on the characteristic lines of the area of interaction (boundary of area of interaction, rib of dihedral angle) and differs little from the

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USSR

VOROB'YEV, N. F., FEDOSOV, V. P., Aerofiz. Issledovaniya, Novosibirsk, 1972, p 93.

precise solution in the other parts of the area of interaction. This approximate solution is used to construct the precise solution by the method of successive approximations. If the end effect of the wing has an influence on the zone of interaction of nonflat wings, the solution of the problem is reduced to solution of a system of generalized Abelian equations. In the case of conical flow, when the intersecting wings are flat, the problem is reduced to the Hilbert problem for a half plane. For arbitrary angle $0 \leq \gamma \leq 2\pi$, the solution is produced in elementary functions. In the diffraction case $\pi \leq \gamma \leq 2\pi$, the influence of nonlinearity of boundary conditions on the solution in the area of the rib of the dihedral angle is demonstrated.

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USSR

UDC 533.06.011

VOROB'YEV, N. F., FEDOSOV, V. P., Novosibirsk

"Supersonic Flow Over a Two-Sided Angle (Conical Case)"

Moscow, Mekhanika zhidkosti i gaza, No. 5, Sep/Oct 72, pp 170-175

Abstract: Supersonic flow over intersecting plane wings forming a two-sided angle $\pi \leq \gamma \leq 2\pi$ is considered within the framework of linear theory. Formulas are obtained for pressure in the interaction zone. The effect of nonlinearity of the boundary conditions in the diffraction section of the bow characteristic surface on the flow parameters in the neighborhood of a rib of the two-sided angle is considered. It is shown that the order of singularity of transverse velocity components as determined by the law given by the change in pressure in the diffraction segment of the bow wave is independent of the size of the two-sided angle. This singularity in order of magnitude corresponds to a velocity singularity induced by a vortex coinciding with the rib of the two-sided angle. The intensity of the vortex arising at the rib of the angle is dependent on the magnitude of the two-sided angle. For example,

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VOROB'YEV, N. F., FEDOSOV, V. P., Mekhanika zhidkosti i gaza, No. 5, Sep/Oct 72, pp 170-175

In the case of a triangular plate ($\gamma = \pi$) at the vertex, there is a drop in the vortex even at small angles of attack. A singularity of the vortex type is present in the numerical solution and its intensity is determined in the process of solving the problem.

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USSR

VOROB'YEV, N. F.

UDC: 533.69.01

"Concerning the Discrete Vortex System of a Wing of Finite Span"

Novosibirsk, Izvestiya Sibirskogo Otdeleniya Akademii Nauk SSSR, Seriya Tekhnicheskikh Nauk, No 13(208), Issue 3, Oct 72, pp 59-68

Abstract: The author considers the problem of flow of an inviscid incompressible stream over the supporting surface of an airfoil. The foil surface itself is replaced by a vortex surface S, while the sheet of the vortices departing from the trailing edge, and in the general case from the lateral and leading edges of the wing as well, is represented by a vortex surface Σ comprised of vortices whose axes are directed along stream lines with steady-state motion. The vortex densities ρ on surfaces S and Σ are determined from nonflow conditions. It is shown that with appropriate selection of the discrete vortices for wing surface substitution and the points at which the nonflow conditions are satisfied, the algebraic sums which represent the velocities induced on the wing surface by the discrete vortices are transformed to converging integrals as the number of vortices is increased, and the condition of descent is satisfied by introducing additional vortices close to the edges.

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1/2 037 UNCLASSIFIED PROCESSING DATE --

TITLE--AN EDGE EFFECT IN SUPERSONIC FLOW PAST A DIHEDRAL ANGLE -U-

AUTHOR--VORCBYEV, N.F.

COUNTRY OF INFO--USSR

SOURCE--AKADEMIIA NAUK SSSR, SIBIRSKOE OTDELENIE, IZVESTIIA, SERILA TEKHNICHESKIKH NAUK, FEB. 1970, P. 7-11

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--MODEL, LINEAR EQUATION, SUPERSONIC FLOW, GAS FLOW, SWEPT WING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1270 STEP NO--UR/0288/70/000/000/0007/0011

CIRC ACCESSION NO--AP0124921

UNCLASSIFIED

2/2 037 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0124921

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CONSIDERATION (IN A LINEAR FORMULATION) OF A SUPERSONIC GAS FLOW PAST A DIHEDRAL ANGLE FORMED BY INTERSECTING WINGS. A SOLUTION IS OBTAINED FOR THE FLOW IN A DIHEDRAL ANGLE WHERE THE INNER ANGLE IS EQUAL TO (M-M) TIMES 180DEGREES. ON THE BASIS OF THE SOLUTION TO THIS MODEL PROBLEM, A SOLUTION IS OBTAINED FOR THE PROBLEM OF THE EDGE EFFECT IN A DIHEDRAL ANGLE WHEN THE INNER ANGLE IS EQUAL TO (1-N) TIMES 180DEGREES. THE LATTER PROBLEM IS REDUCED TO THE SOLUTION OF GENERALIZED ABEL EQUATIONS. FACILITY: AKADEMIIA NAUK SSSR, INSTITUT TEORETICHESKOI I PRIKLADNOI MEDHANIKI NOVOSIBIRSK, USSR.

UNCLASSIFIED

1/2 014 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--PREPARATION OF ALKALI METAL METAPHOSPHATES -U-

AUTHOR-(03)-VOROBYEV, N.I., PECHKOVSKIY, V.V., PTASHKOVA, G.V.

COUNTRY OF INFO--USSR

SOURCE--U.S.S.R. 266,745
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,
DATE PUBLISHED--01APR70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ALKALI METAL, PHOSPHATE, CHEMICAL PATENT, CHEMICAL PRODUCTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3003/1074 STEP NO--UR/0482/70/000/000/0000/0000

CIRC ACCESSION NO--AA0130109
UNCLASSIFIED

2/2 014 UNCLASSIFIED PROCESSING DATE--27NOV70
CIRC ACCESSION NO--AA0130109
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ALKALI METAL METAPHOSPHATES, SUCH AS KPO SUB3, WERE PREPD. BY TREATING THE CHLORIDE OF THE APPROPRIATE METAL WITH A P COMPD. IN THE PRESENCE OF O AT HIGH TEMPS. POCL SUB3 WAS USED FOR THE P COMPD.; THE ALKALI METAL CHLORIDE WAS USED IN MELT FORM; AND THE PREPN. PROCESS TOOK PLACE AT SIMILAR TO 1000DEGREES.
FACILITY: KIROV, S. M., BELORUSSIAN TECHNOLOGICAL INSTITUTE.

UNCLASSIFIED

UDC 539.3:534.1

USSR

VOROB'YEV, N. I.

"Stability of Composite Rods Under the Action of Concentrated and Distributed Loads"

Tr. Novocherkas. politekhn. in-ta (Works of Novocherkassk Polytechnical Institute), 1972, Vol. 233, pp 120-124 (from RZh-Mekhanika, No 8, Aug 72, Abstract No 8V266)

Translation: The stability of a composite (mesh) rod compressed by a force P and a longitudinal distributed load q (masts, towers) is discussed. The pliability of the connecting lattice is determined by the familiar Engesser-Timoshenko methods. Two examples are considered: a rod of constant cross section with hinge-supported ends and a tower with a lower embedded end. The area of the tower varys according to the law $F = F_1\psi$, the moment of inertia $I = I_1\psi^3$ where $\psi = x/l$, x is the distance from the free end of the tower and l is the length. In both cases the fourth-order differential equation of the bent axis is transformed into a second-order integro-differential equation. An approximation method presented in a previous article by the author is supplied to solve the resulting integro-differential equation (Tr. Novocherk. politekhn. in-ta, 1966, Vol. 163). This

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VOROB'YEV, N. L., Tr. Novocherkas. politekhn. in-ta, 1972, Vol. 233, pp 120-124

method can be divided into two parts. In the first part, as in the consecutive approximation method, a sequence of functions $y_1, y_2, \ldots y_k$ is determined in which y_k is obtained from y^{k-1} by solving the corresponding boundary value problem. In terms of the differential equation containing the eigenvalue ν as a factor, ν_y is replaced by y^{k-1} and in terms free of ν, y is replaced by y_k. In the first approximation a y is selected satisfying all or the basic boundary conditions. For example, for the problem

$$y'' = -\nu y , \quad y_1 = \psi - 2\psi^3 + \psi^4 \qquad (1)$$

is used as a first approximation satisfying all boundary conditions $y(0) = y(1) = y''(0) = y''(1) = 0$. Then from the condition $y_2'' = -y_1$, a second approximation is found $y_2 = 1/30\ (3\psi - 5\psi^3 + 3\psi^5 - \psi^6)$, etc. The process ordinarily ends at the second approximation. In the second part collocation at two points of the rod is carried out instead of averaging by the Ritz-Bubnov method: the least stressed ($\psi = 0$) which gives the value of ν_1 and the most stressed ($\psi = 1/2$ or $\psi = 1$) which gives

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VOROB'YEV, N. L., Tr. Novocherkas. politekhn. in-ta, 1972, Vol. 233, pp 120-124

the value of ν_2. It is assumed that $\nu_2 < \nu_{av} < \nu_1$. In the above problem the second part has the following form. We find from equation (1)

$$\nu = 3y'(\psi)/y(\psi) = y_1(\psi)y_2(\psi). \qquad (2)$$

By substituting $\psi = 0$ we find $\nu_1 = 10$ and by substituting $\psi = 1/2$ we find $\nu_2 = 600/62$. (In the article it was printed $\psi = 1$ but for $\psi = 1$ the value of ν takes on an indeterminate value 0/0). The eigenvalue ν for a column under the action of its own weight without considering the shift in transverse cross section and considering this shift is found in a similar fashion. In considering the second example (a mast of variable cross section considering and without considering shift), there is taken as a first approximation $y_1 = 2\psi - \psi^2$, which satisfies only the basic boundary condition $y(0) = y'(1) = 0$. These conditions are satisfied in the second approximation. A comparison of these values with available exact solutions shows only a slight divergence. In all cases ν_{av} is considerably greater than the exact values. The lower value of ν in certain cases is lower but in other cases is higher than the exact value. 6 ref. A. V. Dyatlov.
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USSR

VOROB'YEV, N. N. and YEPIFANOV, G. V.

"Possible Win Vectors in Bimatrix Games"

Teoriya Igr [Games Theory -- Collection of Works], Yerevan, 1973, pp 110-113 (Translated from Referativnyy Zhurnal Kibernetika, No 10, 1973, Abstract No 10V462)

Translation: Suppose $\Gamma = \langle A, B \rangle$ is a bimatrix game. Vector (α, β) is called a possible win vector (p.w.v.) if strategies X, Y can be found for which $(\alpha, \beta) = (XAY^T, XBY^T)$. Suppose $R(\Gamma)$ is the set of all p.w.v. The main results are: 1) any vector from $R(\Gamma)$ is a p.w.v. either in a certain 2×2 subgame or in a certain subgame with three pure strategies for one player, one for the other. 2) $R(\Gamma)$ is a quasi-star set (and, therefore, singly connected).

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USSR

UDC 621.382.002

VERNIKOV, M.A., VOROB'YEV, N.N., MARKOVA, T.A., ROSINA, L.A., SHCHEGLOV, A.S.

"Study Of The Effect Of Thermocompression Regimes On The Electrical Parameters Of Transistors"

Elektron.tekhnika.Nauch.-tekhn.sb. Poluprovodn.pribory (Electronic Technics. Scientific-Technical Collection. Semiconductor Devices), 1971, Issue 4(61), pp 161-166 (from RZh:Elektronika i yeye primeneniye, No 4, April 1972, Abstract No 4B526)

Translation: The study was conducted on planar silicon n-p-n transistors with an epitaxial base. The thermocompression regime was controlled by two parameters --the temperature and pressure at the wedge [jgle], which were varied in the limits 320--390° C and 25--31.3 kg/mm^2, respectively. It is shown that an increase of the temperature and pressure at the wedge leads to a significant instability of the parameter h_{21E} in the course of 500-hour tests on reliability. The mechanism of the effect of remanent strains on the instability of h_{21E} is discussed. It is proposed first to set the temperature and pressure at the minimum level which assures a sufficient mechanical stability, and secondly to maintain the regime with a precision not worse than 5 percent. 4 ill. 17 ref.G.I.

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USSR

UDC: 51

VOROB'YEV, N. N., GRUND, Yu.

"Model of Competing Prices on a Static Single-Product Market"

V sb. Primeneniye mat. v ekon. (Use of Mathematics in Economics--collection of works), vyp. 7, Leningrad, Leningrad University, 1972, pp 18-35 (from RZh-Kibernetika, No 6, Jun 72, Abstract No 6V383)

Translation: The axiomatic method of analysis is used for studying a static single-product market. The Sheply value vector is considered as a solution. The following cases are examined: 1) each seller has a unit of goods which has a utility c for him, and each buyer is in a position to purchase a unit of goods which has utility d for him; the number of buyers is equal to the number of sellers; 2) as in the first case except that the number of buyers and sellers is different; 3) there are n sellers and r buyers, each seller having a certain quantity of the same infinitely divisible good with inequality of supply and demand; 4) an unbalanced market model where each seller satisfies the overall demand of the buyers; 5) an unbalanced market model with a single seller who satisfies the overall demand of the buyers; 6) an unbalanced market model with a single seller who satisfies the demand of only one buyer. G. Tkachenko.

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USSR

UDC: 51

VOROB'YEV, N. N.

"Applications of the Theory of Games"

Prilozheniya teorii igr. In-t fiz. i mat. AN LitSSR, Vil'nyus. un-t Leningr. otd. tsentr. ekon.-mat. in-ta. II Vses. konf. po teorii igr (cf. English above. Institute of Physics and Mathematics, Academy of Sciences of the Lithuanian SSR, Vil'nyus University, Leningrad Department of the Central Mathematical Economics Institute. Second All-Union Conference on the Theory of Games), Vil'nyus, 1971, 118 pp, ill. n/c (from RZh-Kibernetika, No 1, Jan 72, Abstract No 1V758 K)

Translation: A systematic exposition of the main problems of the applied aspect of the theory of games. Chapter I. Applied Possibilities of the Theory of Games. §2 [sic]. The Theory of Games as a Means of Mathematizing Knowledge. §3. Mathematical Content of the Theory of Games. §4. Methods of Using the Theory of Games. §5. Difficulties in Applications of the Theory of Games. Chapter II. The Theory of Games and Conflicts. §1. Conflicts. §2. The Theory of Games and Economics. §3. The Theory of Games and Military Science. §4. The Theory of Games and Problems of Disarmament. §5. The Theory of Games and Biology. §6. The Theory of Games and The Hu-

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-USSR-

VOROB'YEV, N. N., Prilozheniya teorii igr, Vil'nyus, 1971

manities. Chapter III. The Theory of Games in Decision Making Under Conditions of Indeterminacy. §1. Indeterminacy. §2. The Theory of Games and Prognosis. §3. The Theory of Games and Economic Decision Making Under Conditions of Indeterminacy. §4. Applications of the Theory of Games in Technology.

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USSR

UDC 621.382.3:621.317.799

VOROB'YEV, N.N., KREYNFEL'D, YU. S., BARYSHNIKOVA, I.A.

"Comparison Of Drift Of Principal Parameters Of Silicon Planar n-p-n Transistors With Various Biases On The p-n Junctions"

Elektron. tekhnika. Nauchno-tekhn. sb. Poluprovodn. pribory (Electronic Technology. Scientific-Technical Collection. Semiconductor Devices), 1970, Issue 2(52), pp 116-124 (from RZh--Elektronika i yeye primeneniye, No 2, February 1971, Abstract No 2B519)

Translation: The regularity is experimentally investigated of the drift of the parameters: h_{21e}, I_{CBO}, and I_{EBO} of type n-p-n silicon planar transistors, with the tests under conditions of various biases at the junctions. A comparison is conducted of the drift of the parameters in the case of tests in an active regime. It is shown that tests with reverse biases at the collector and emitter junctions can be a sufficiently effective technological test for rejecting nonstable type n-p-n planar transistors. 5 ref. Summary.

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USSR

UDC: 621.375.4

BASKAKOV, I. V., VOROB'YEV, N. V., RYZHKOV, G. I.

"On the Problem of Matching a Photodiode and Semiconductor Amplifier to Maximize the Signal-to-Noise Ratio"

Tr. Mosk. vyssh. tekhn. uch-shcha im. N. E. Baumana (Works of the Moscow Higher Technical Academy imeni N. E. Bauman), 1972, No 150, pp 52-56 (from RZh-Radiotekhnika, No 12, Dec 72, abstract No 12D93 by G. S.)

Translation: Radiant energy receivers and transistorized amplifiers are used in many high-frequency receiver devices in automation. The problem of matching a radiant energy receiver and amplifier is fairly complicated in the case of the range of amplitudes of radiant fluxes which are fed to the radiant energy receiver, and reception of small useful signals against a background of appreciable constant flux. An expression for signal-to--noise ratio is derived on the basis of which optimum matching of the photodiode with the amplifier is possible. As an example, the authors propose realizations of the input stages of a reception device for a pulse signal in the optical band. Three illustrations, bibliography of two titles.

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USSR

UDC 632.954

VOROB'YEV, N. YE., Izmail Experimental Station, All Union Scientific Corn Institute

"The Effect of Herbicides on Agrophytocoenosis of Pea"

Moscow, Khimiya v Sel'skom Khozyaystve, Vol 10, No 7, (105), 1972, pp 47-50

Abstract: In the south-western Ukraine the agrophytocoenosis of pea consists principally of spring crop dicotyledonous annual weeds -- bindweed pea and field mustard -- as well as perennial ones -- Canada thistle and bindweed. The annual weeds were lowered considerably after treatment with 1.5 and 3 kg/hectare of DNOK and 1.5 and 2.5 kg/hectare of prometrin. DNOK was more effective against the mustard and knotweed, while prometrin was active against the knotweed and amaranth. Both herbicides as well as manual weeding increased the yield of pea and of the culture following it -- the winter crop wheat. Dikotex-80 applied by itself and in combination with DNOK was effective against the mustard, but not against the knotweed. At a dose of 1 kg/hectare Dikotex-80 lowered the yield of pea. Simazin was only slightly effective against pea weeds and had a detrimental effect on the winter crop wheat. None of these agents proved effective against the perennial weeds.

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USSR

UDC: 533.9.07.088

Vorob'ev, O. S., Gordiyenko, I. E., et al.

"Measurement of Distribution of Electron Concentration of a Plasma by Cross-section of Stream in a Closed Vacuum Chamber"

Moscow, Metrologiya, No. 9, 1972, pp. 46-51.

Abstract: A method and apparatus are described for measurement of the distribution of electron concentration of an axisymmetrical plasma stream in closed chambers. The advantages of the use of the method of refraction under these conditions are demonstrated. Analysis of the sources of error have shown that the total error in measurement of the distribution of electron concentration is not over 20%.

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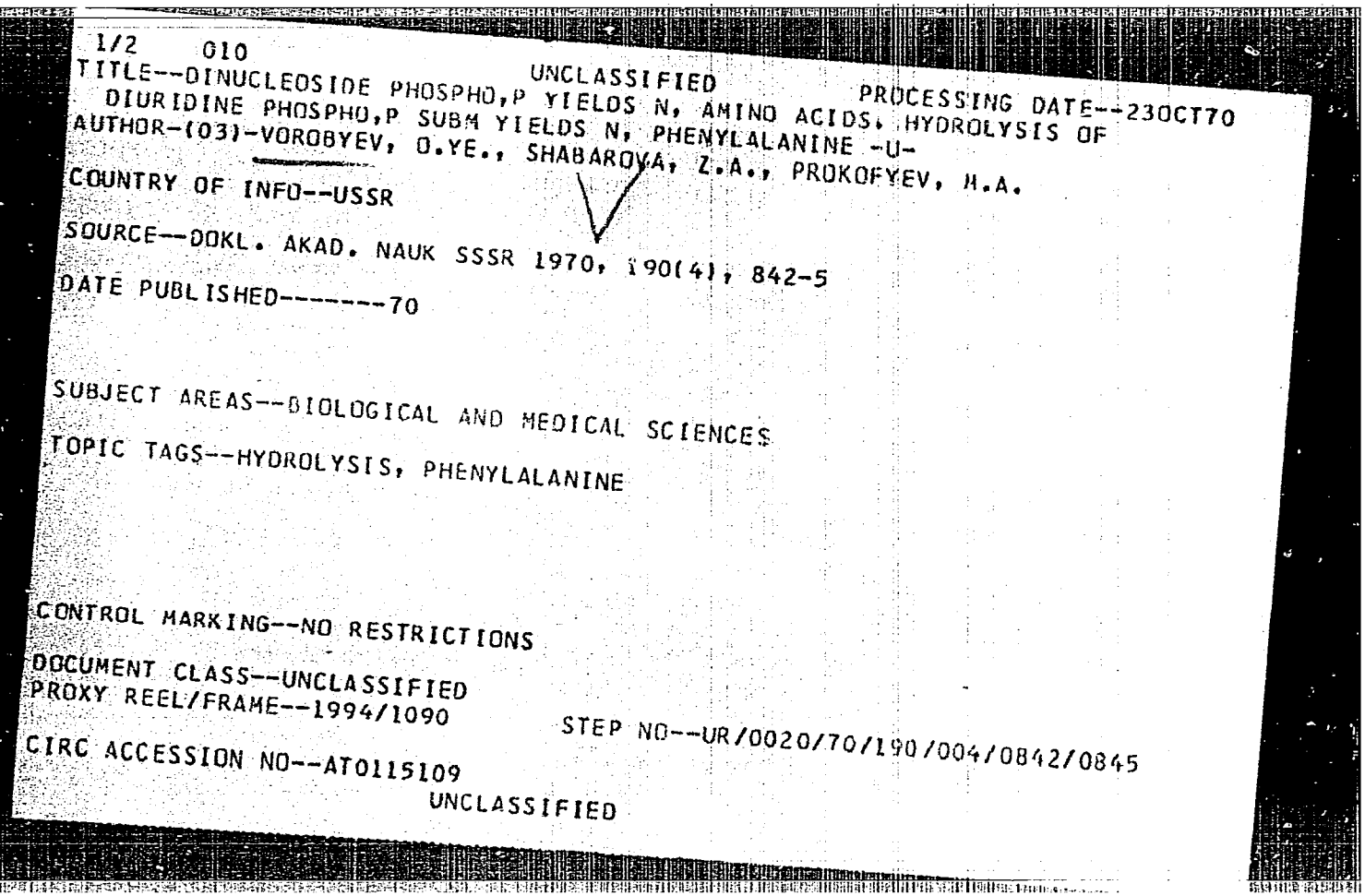

1/2 010 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--DINUCLEOSIDE PHOSPHO,P YIELDS N, AMINO ACIDS, HYDROLYSIS OF DIURIDINE PHOSPHO,P SUBM YIELDS N, PHENYLALANINE -U-

AUTHOR-(03)-VOROBYEV, O.YE., SHABAROVA, Z.A., PROKOFYEV, M.A.

COUNTRY OF INFO--USSR

SOURCE--DOKL. AKAD. NAUK SSSR 1970, 190(4), 842-5

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--HYDROLYSIS, PHENYLALANINE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1994/1090 STEP NO--UR/0020/70/190/004/0842/0845

CIRC ACCESSION NO--AT0115109

UNCLASSIFIED

2/2 010 UNCLASSIFIED

CIRC ACCESSION NO--AT0115109 PROCESSING DATE--23OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. I IS PRACTICALLY INERT TO ALKALI AT PH 10.5 IN 1 HR AT 37DEGREES, WHILE IN 6 HR THE HYDROLYSIS IS NOT OVER 15PERCENT. HOWEVER IN 20 HR UNDER THE SAME CONDITIONS ALMOST 90PERCENT OF THE COMPD. IS DESTROYED. THE INTERNUCLEOTIDE LINK IN 2 PRIME,ACETYLATED DIURIDINE PHOSPHATE IS ALMOST NOT AFFECTED AT ALL UNDER THESE CONDITIONS. THUS THE ALK. CLEAVAGE OF I IS DETD. BY THE RATE OF DEACETYLATION OF THE 2 PRIME-OH GROUP. THE KINETIC DATA WERE TABULATED FOR I, DIURIDINE PHOSPHATE, URIDINE CYCLOPHOSPHATE, O,ISOPROPYLIDENEURIDINE, PHENYLALANINE ME ESTER AT PH 10.5 AT 37DEGREES. I IN N HCL IN 1 HR AT 37DEGREES GAVE EQUIMOLAR AMTS. OF DIURIDINE PHOSPHATE AND THE AMINO ACID. IN N NAOH IN 18 HR I GAVE 2 PRIME (3 PRIME). URIDYLIC ACID, O,ISOPROPYLIDENEURIDINE AND PHENYLALANINE.

FACILITY: MOSK. GOS. UNIV. IN. LOMONOSOVA, MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC: 51:155.001.57:612.82

GRANOVSKAYA, R. M., VOROB'YEV O. Yu.

"Associative Neuron Memory and Complexity of Neurons"

V sb. Vychisl. tekhn. in vopr. kibernet. (Computer Technology and Problems of Cybernetics--collection of works), vyp. 8, Leningrad, Leningrad University, 1971, pp 107-120 (from RZh-Kibernetika, No 11, Nov 71, Abstract No 11V890)

Translation: The authors consider the problem of constructing a memory model from homogeneous structural groups, where this model has a certain type of generalization of input codes, i. e. it has certain properties of associative memory. Consideration is also given to formulation of criteria of complexity for neuron models. The number of different states of a neuron which may show up with a change in its threshold is used as the basic criterion of complexity. In this connection, the threshold of a neuron is defined as the minimum amount of excitation necessary for the neuron still to be able to generate a pulse. It is noted that the proposed criteria can be used to evaluate and compare the complexity not only of individual

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USSR

GRANOVSKAYA, R. M., VOROB'YEV, O. Yu., Vychisl. tekhn. i vopr. kibernet., vyp. 8, 1971, pp 107-120

neurons with various sets of parameters, but also circuits of neurons of different types and made up of several layers with different kinds of connections. Illustrative examples are given. V. Mikheyev.

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USSR

UDC: 8.74

GRANOVSKAYA, R. M., VOROB'YEV, O. Yu.

"Synthesis of a Mathematical Model of a Neuron"

V sb. Vychisl. tekhn. i voor. kibernet. (Computer Technology and Problems of Cybernetics--collection of works), vyp. 6, Leningrad, Leningrad University, 1971, pp 139-156 (from RZh-Kibernetika, No 1, Jan 72, Abstract No 1V1107)

Translation: An algorithm is proposed for construction of a net of simple threshold elements, enabling simulation of the operation of any pregiven neuron of the summation neuron type, or the innovation and curvature neuron type. This algorithm is made up of two independent algorithms. Important requirements are made on the minimum number of component elements of the net, high level of reliability in operation of the net, and these requirements make the problem of particular interest both from the standpoint of the theory of neuron synthesis, and from the standpoint of technical realization from the threshold elements. A description is given of a representation of a neuron network in the form of a graph, and operations on graphs are defined. The scheme of an algorithm for construction

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USSR

UDC: 8.74

GRANOVSKAYA, R. M., VOROB'YEV, O. Yu., Vychisl. tekhn. i vopr. kibernet., vyp. 6, Leningrad, Leningrad University, 1971, pp 139-156

of a minimum graph is given as well as an algorithm for synthesis of an n-input threshold element. A. Doroshenko.

2/2

USSR

UDC: 621.372.828

VOROB'YEV, P. A., MALYUTIN, N. D., SOLOMONIK, I. Sh.

"Computing the Capacitance of an Asymmetrical Zigzag Ribbon Line With Shielding"

Kiev, Izvestiya VUZ - Radioelektronika, vol. 14, No. 5, 1971, pp 489-493

Abstract: Open ribbon delay lines with better operating characteristics than ordinary lines of a similar type are examined. The superiority of these lines results from the use of shielding which reduces radiation losses, increases the linear capacitance, and thus reduces the dimensions of the ribbon conductor. For compactness in the 30-100 MHz range, the lines are manufactured in zigzag form. In this type of construction, the shielding reduces coupling between neighboring strips and provides phase shift linearity along the length of the line. Results are given of the investigation of the field of the line in electrostatic models, a picture of the field being obtained on electrically conducting paper. A method is offered for correcting the inaccuracies in computing the capacitance of the line committed by earlier researchers, and curves of experimental results as compared with the results computed by this method are given.

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USSR

UDC 541.8:541.11

VASIL'YEV, V. P., VOROB'YEV, P. N., KHVOSTOVA, I. B., and MILOVANOVA, V. A., Ivanovo Chemico-Technological Institute, Chair of Analytical Chemistry

"Standard Heat of Solution of $TiCl_4$ in Nitric Acid"

Ivanovo, IVUZ Khimiya i Khimicheskaya Tekhnologiya, Vol 15, No 1, 1972, pp 47-49

Abstract: The chemistry of titanium, including the thermodynamic properties of its compounds, are of the greatest practical significance. With the use of an improved calorimeter having automatic recording (See V. P. VASIL'YEV et al., Zh. Neorgan. Khimii, 11, 699, 1966), heat of solution, heat of dilution, and heat of destruction of the ampoule, were determined over a wide range of concentration of the HNO_3 solution. The new empirical data made it possible to develop more precise formulas for determining those quantities for the solution of $TiCl_4$ in HNO_3. All data and formulas, along with graphic representation of the relationship between $TiCl_4$ solution and final HNO_3 concentration, are included in the paper.

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USSR

UDC: None

VOROB'YEV, A. A., BOKIDAYEV, A. Ya., VOROB'YEV, S. A., and KAPLIN, V. V.

"Scattering of Electrons by Monocrystals"

Leningrad, Fizika Tverdogo Tela, vol 14, No 7, 1972, pp 2157-2159

Abstract: This paper is the consequence of an earlier one (H.C.H. Nip et al, Phys. Lett., 28A, 1968, p 324) in which the possibility of the existence of stable trajectories for fast electrons scattered by a monocrystal was discussed. Such an effect should result in the anomalous passage of electrons through the crystal if the axis of the incident beam coincides with one of the crystallographic directions of the target. This paper describes measurements made to detect such an anomalous electron flow. The electron beam was obtained from a radioactive source, $(Sr+Y)^{90}$, with the angular scattering of the electron beam incident on the target reduced to 0.5° through strong collimation. NaCl monocrystals were used as the target, and the recording device was the USD-1 scintillation counter. A curve is plotted for the electron scattering by a 190-μ-thick NaCl crystal as a function of the rotational angle of the crystal axis with respect to the direction of the incident beam. The authors, members of the S. M. Kirov Polytechnical Institute at

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USSR

VOROB'YEV, A. A., et al, Fizika tverdogo tela, vol 14, No 7, 1972, pp 2157-2159

Tomsk, express their gratitude to I. A. Tsekhanovskiy for his comments on the experimental results.

2/2

USSR

UDC: 681.3.06:51

VOROB'YEV, V. A.

"R-LYaPAS -- a Base Language for Modeling of Digital Devices"

V sb. Vychisl. sistemy (Computer Systems--collection of works), vyp. 39, Novosibirsk, 1970, pp 67-80 (from RZh-Kibernetika, № 11, Nov 71, Abstract No 11V811)

Translation: A base language is constructed for a growing system of modeling of digital devices. The input language of the system is constructed by expanding the first level of the LYaPAS language (Russian acronym from Logicheskiy Yazyk dlya Predstavleniya Algoritmov Sinteza releynykh ustroystv: logic language for representing algorithms for synthesis of relay devices), and is accordingly called "Expanded LYaPAS" or "R-Lyapas" [the Russian initial letter of "Rasshirennyy" -- expanded]. The basis is given for the construction of this language. V. Mikheyev.

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USSR

UDC 539.1.01

VOROB'YEV, A. A., VOROB'YEV, V. A., TARASOV, G. P., Tomsk Polytechnical Institute imeni S. M. Kirov

"On the Question of Evaluating the Variation in Bremsstrahlung Behind a Plane Layer With a Cylindrical Cavity"

Tomsk, Izvestiya Vysshikh Uchebnykh Zavedeniy - Fizika, No. 12, 1970, pp 123-125

Abstract: This treatment of the problem assumes a source with a continuous spectrum with a Schiff distribution; previous studies assumed a monoenergetic source. An expression is given for the perturbation in the intensity of bremsstrahlung behind a layer with a cylindrical cavity (on the axis of the cavity) under irradiation of the layer by a plane perpendicular beam. The coefficients of the expression for iron are graphed as a function of the thickness of the layer for bremsstrahlung with maximum energies 6 Mev and 30 Mev. The coefficients determine the perturbation and intensity on the axis of the cavity where the contribution of the scattered component should be greatest due to the symmetry of the problem. It is pointed out that the effect of the scattered component is slight, and it is therefore concluded

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USSR

VOROB'YEV, A. A., et al, Izvestiya vysshikh uchebnykh zavedeniy - fizika, No. 12, 1970, pp 123-125

that if a plane layer with a cavity is irradiated by a perpendicular beam of bremsstrahlung, the effect of the position of the cavity and its shape on the magnitude of the perturbation in intensity behind the layer is slight. The contribution to the total variation of the scattered component, which gives information on the position and shape of the cavity, is of a magnitude no less than the second order compared with the contribution of the direct component, which carries information on the ray dimension of the cavity (both components being considered infinitesimals).

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1/2 068 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--AGING OF A FLAME RESISTANT GLASS REINFORCED PLASTIC PNFA -U-

AUTHOR-(03)-VOROBYEV, V.A., ANDRIANOV, R.A., DUMOV, S.N.

COUNTRY OF INFO--USSR

SOURCE--STROIT. MATER. 1970, (3), 35-6

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--FIRE RESISTANT MATERIAL, GLASS FIBER, POLYESTER RESIN, REINFORCED PLASTIC, SEASONAL VARIATION, WEATHERING, PLASTIC MECHANICAL PROPERTY, TENSILE STRENGTH, POLYMER BINDER, RADIATION EFFECT/(U)PNFA GLASS REINFORCED PLASTIC, (U)FOSFACRYLAT POLYMER BINDER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/1242 STEP NO--UR/0228/70/000/003/0035/0036

CIRC ACCESSION NO--AP0128658

UNCLASSIFIED

2/2 068 UNCLASSIFIED

CIRC ACCESSION NO--AP0128658 PROCESSING DATE--20NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AGING OF FLAME RESISTANT PNFA PLASTIC, CONTG. FOSFACRYLAT AS 1 OF THE BINDERS (U.S.S.R. 220,494), IN BOILING WATER, OPEN AIR, OR AT 100DEGREES UNDER ARTIFICIAL IRRADN. WAS APPROX. THE SAME AS THAT OF A PLASTIC (GLASS FIBER POLYESTER LAMINATE) CONTG. THE SAME COMPONENTS EXCEPT FOR FOSFACRYLAT. THE PROPERTIES (BENDING STRENGTH, TENSILE STRENGTH AT BREAK, IMPACT STRENGTH, WATER ABSORPTION, FLAME RESISTANCE) OF PNFA SHOWED CONSIDERABLE SEASONAL VARIATIONS, BUT LITTLE OVERALL CHANGE AFTER 3 YEARS' STORAGE IN THE OPEN.

UNCLASSIFIED

1/2 019 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--PHOTON ELECTRON TRANSFORMATIONS IN SUBSTANCES DURING PASSAGE OF BREMSSTRAHLUNG RADIATION AND ITS PRACTICAL APPLICATION -U-

AUTHOR-(02)-GELASHVILI, SH.SH., VOROBYEV, V.A.

COUNTRY OF INFO--USSR

SOURCE--SOOBSHCH. AKAD. NAUK GRUZ. SSR; 57: 309-12(FEB 1970)

DATE PUBLISHED----FEB70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--GAMMA TRANSITION, GAMMA RAY PHOTOELECTRIC EFFECT, BREMSSTRAHLUNG, PAIR PRODUCTION, IONIC CRYSTAL, POTASSIUM CHLORIDE, RADIATION INTENSITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3001/2227 STEP NO--UR/0251/70/057/000/0309/0312

CIRC ACCESSION NO--AP0127589

UNCLASSIFIED

2/2 019 UNCLASSIFIED

CIRC ACCESSION NO--AP0127589 PROCESSING DATE--30OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TRANSFORMATION FO GAMMA RADIATION IN THE ENERGY RANGE OF 10 TO 30 MEV DURING ITS PASSAGE THROUGH THIN CRYSTALS OF KCL, KBR, AND KL WAS STUDIED. THE TRANSITION CURVES (RELATIVE INTENSITY AS A FUNCTION OF CRYSTAL THICKNESS AND RADIATION ENERGY) ARE ALSO CONSIDERED. BLACKENING OF A ROENTGEN PLATE WAS FOUND TO BE INVERSELY PROPORTIONAL TO THE THICKNESS OF THE CRYSTAL PLACED IN FRONT OF IT. THE DEPENDENCE OF THE PLATE BLACKENING ON THE CRYSTAL DENSITY WAS ESTABLISHED. FACILITY: TBILISI STATE UNIV., USSR.

UNCLASSIFIED

USSR

VOROBYEV, V. A.

UDC 621.372.543.2:621.374.33(088.8)

"Frequency Selector of Periodic Oscillations"

USSR Author's Certificate No 252500, Filed 3 Apr 68, Published 24 Feb 70 (from RZh-Radiotekhnika, No 9, Sep 70, Abstract No 9D32P)

Translation: The proposed selector with a regulated selection band contains a controllable rectifier, the signal input of which is the input to the selector, and the control channel included between the signal and commuting inputs of the rectifier and constituting a series connection of the square pulse shaper and the two-channel follow-up system with a coincidence cascade at the output which is common for both channels. In order to increase the operating reliability of the selector, each channel of the follow-up system is executed in the form of a series-included converter (for example, an integrator) of the pulse repetition frequency to a constant voltage and a threshold cascade.

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USSR

UDC 614.37:691.175(049.3)

VOROB'YEV, V. A., Honored Scientist and Technician, RSFSR, Doctor of Technical Sciences and ANDRIANOV, R. A., Candidate of Technical Sciences (Reviewers)

Gigyena i stroitel'nyye plastmassy (Hygiene and Building Plastics), by K. I. Stankevich, Kiev, Izd-vo "Budivel'nik" 1968

Moscow, Gigyena i Sanitariya, No 1, 1970, pp 117-119

Abstract: More than three-fourths of the monograph is devoted to a description of polymers, stabilizers, plasticizers, and polymer building materials. The hygienic characteristics of the raw material used in the production of polymers are presented in considerable detail, but very little information is given on the hygienic evaluation of polymer building materials. The errors, contradictions, and generally muddled organizations of the material make the book useless.

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USSR

UDC 678.675:678.06-419.8:677.521

CHUDINA, L. I., TANUNINA, P. M., LITOVCHENKO, S. I., CHERVINSKAYA, M. A., CHERDASOV, M. V., VOROB'YEV, V. D., VLASOVA, K. N., KISELEV, B. A., and DAVYDOVA, I. F.

"Polyimides and Polybenzimidazols for Plexiglasses and Cements"

Moscow, Plasticheskiye Massy, No 4, 1973, pp 15-17

Abstract: The physical and chemical properties were determined for a number of thermoplastics -- such as the polyimides (PI), polyamidoimides (PAI), and polybenzximidazols (PBI) -- forming 15-68% solutions with different solvents. The PAI and PBI plus three of the PI resins formed linear structures; two of the PI resins formed a three-dimensional structure. The linear resins have a greater strength than the crosslinked below temperatures of about 300°C. The data are given in several tables and graphs.

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USSR

UDC: 621.785.019

VOROB'YEV, V. G.

"Prospective Means for Decreasing Deformation During Heat Treatment of Machine Parts"

Progressivn. Metody Term. i Khim.-Term. Obrabotki [Progressive Methods of Heat and Chemical-Heat Treatment -- Collection of Works], Moscow, Mashinostroyeniye Press, 1972, pp 71-79 (Translated from Referativnyy Zhurnal Metallurgiya, No 8, 1973, Abstract No 81856, by A. Babayeva).

Translation: Mathematical methods are currently being developed for prediction of the change of shape of certain (not very complex) geometric bodies during heat treatment. In order to decrease the warping during heating, optimal cooling conditions must be maintained (measures are indicated). The trends in solution of problems of stabilization of the dimensions of precision parts are indicated: methods of stabilization of structure and decreasing residual internal stresses (repeated tempering, aging, cold processing; selection of technological versions which excite the least stresses); the use of materials with increased resistance to slight plastic deformations, capable of withstanding the influence of internal stresses, various special methods of stabilization, such as vibration-heat treatment. 2 figures; 1 table.

1/1

Semiconductor Technology

USSR

UDC 546.682'19:535.232.1

VOROB'YEV, V. G., KOTRUBENKO, B. P., LANGE, V. N., and SOBOLEV, V. V.,
Institute of Applied Physics, Academy of Sciences Moldavian SSR

"Reflection Spectra and Structure of Zones of Highly Alloyed Indium Arsenide"

Moscow, Neorganicheskiye Materialy, Vol 6, No 8, Aug 70, pp 1524-1525

Abstract: In order to continue studies on the influence of strong alloying on the optical transitions in the $E > E_g$ area in compounds such as $A^{III}B^{V}$, the authors studied the reflection spectra of etched mirror surfaces of InAs crystals, alloyed with tellurium (0.05, 0.1, 1, 2, and 5 at. %) and selenium (0.5, 1, 2, 5, and 10 at. %). In InAs-Te specimens with increasing alloying the maxima principally expand (particularly the long wave maxima), then the entire band is strongly spread with considerable displacement toward the long wave area. When alloyed with selenium, indium arsenide shows the expansion and displacement of the band with lower concentrations of the impurity. Alloying has comparatively little influence on the short wave portion of the band and a very strong influence on the long wave portion of the band.

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Conferences

USSR

VOROB'YEV, V. G.

"Information on the Third International Symposium on General Metallurgy and Heat Treating of Metals"

Moscow, Metallovedeniye i termicheskaya obrabotka metallov, No 6, 1972, pp 69-71

Abstract: The Third International Symposium on General Metallurgy and Heat Treating of Metals was held in Budapest, Hungary, from 23 to 27 November 1971. The symposium was sponsored by the Scientific Society for Machinery, the Budapest Institute of Machine Building Technology and other large industrial establishments. The gathering was attended by about 300 representatives from the Hungarian People's Republic, Federal Republic of Germany, People's Republic of Bulgaria, Czechoslovak Republic, Austria, Polish People's Republic, USSR, Holland, France, Sweden, Switzerland, and other countries. The participants heard reports on the following topics: Heat Treatment-Structure-Properties (Prof. A. Roze, FRG); High-Temperature Nitriding of Steels and Refractory Metals (Yu. M. Lakhtina, USSR); Structurization in the Diffusion Layer (P. Birk, FRG); Gas Carburization Control (I. Wuening, FRG); Carbonitriding in Furnaces With Drop Feed of N-Containing Organic Substances (Yu. Vyshkovskiy, et al, PPR); Low-Temperature Short-Term Nitriding

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203530006-0"

USSR

VOROB'YEV, V. G., Metallovedeniye i termicheskaya obrabotka metallov, No 6, 1972, pp 69-71

(Yu. Tatsikovskiy, PPR); C-Constant Processes (I. Mueller, G. Krzhiminskiy, FRG); "Soft Nitriding" of Iron-Base Cermets (I. Mueller, FRG); Boronizing of Various Steels (A. Karosei, HPR; G. Kunst, FRG; G. Hueterer, Austria); Advantages of Inductors With Ferrite Magnetic Circuits (Yu. V. Vatev, et al, PRB); New Equipment for High Current Temperature Control (T. Vaas, HPR), and a number of other significant topics. A special session was held to announce the organization of the International Society for Heat Treating of Materials in October 1971 in Zurich and to signify the fact that symposia on metal sciences sponsored by countries under the Council of Mutual Economic Aid have been going beyond their initial scope to become international forums for information exchange in science and technology.

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USSR

UDC 612.017:612.432:612.45

BUBNOV, V. D., and VOROB'YEV, V. I.

"Resistance of White Rats and the State of Their Hypophysis-Adrenal Gland System During Combined and Successive Action of High Temperature and Acute Hypoxia"

Moscow, Biologicheskiye Nauki, No 10,1971, pp 38-43

Abstract: The resistance of white rats to the separate and combined action of two stress factors -- 1) hypoxic hypoxia produced by keeping each animal in a sealed 3-liter glass container (humidity controlled) and 2)hyperthermia produced by placing the animals in open glass containers in an incubator set at 39°C -- was investigated by determining the survival time and the activity of the hypophysis-adrenal gland system (HAS) by means of an index representing a sum of the changes occurring in eosinophil cell concentration in peripheral blood, ascorbic acid concentration in the adrenal cortex, eosinophilolytic activity in the hypophysis and adrenal glands, and the weight of the adrenal glands. It was found that the animals are most resistant (the longest survival time) when hypoxia is preceded by hyperthermia, and somewhat less resistant when hypoxia is not preceded by hyperthermia; in either case, the HAS is

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USSR

BUBNOV, V. D., and VOROB'YEV, V. I., Biologicheskiye Nauki, No 10, 1971, pp 38-43

highly active just prior to death. The animals are much less resistant when hypoxia with hyperthermia is preceded by hyperthermia, and least resistant when the two stress factors are applied without preliminary hyperthermia; in these two cases, there is no correlation between the activity of the HAS and the survival time.

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1/2 020 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--HISTONES FROM THE SPERM AND EMBRYOS OF THE GROUNDLING MISGURNUS FOSSILIS -U-

AUTHOR-(04)-VOROBYEV, V.I., VINOGRADOVA, I.A., GINEITIS, A., NIVINSKAS, G.

COUNTRY OF INFO--USSR

SOURCE--TSITOLOGIYA 1970, 12(2), 198-203

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--LOACH, REPRODUCTIVE SYSTEM, PROTEIN, AQUEOUS SOLUTION, ELECTROPHORESIS, POLYACRYLAMIDE RESIN, CARBON ISOTOPE, CHEMICAL LABELLING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/0380 STEP NO--UR/9053/70/012/002/0198/0203

CIRC ACCESSION NO--AP0127961

UNCLASSIFIED

2/2 020 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0127961

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. HISTONES ISOLATED FROM THE SPERM AND EMBRYOS OF THE LOACH M. FOSSILIS AT DIFFERENT STAGES OF DEVELOPMENT WERE INVESTIGATED USING ELECTROPHORESIS IN POLYACRYLAMIDE GEL. FRACTION COMPN. OF EMBRYONIC HISTONES DIFFERED AT THE BLASTULA AND GASTRULA STAGES, AND THE HISTONE COMPN. CHANGES WERE FIRST OBSD. AT TRANSITION FROM BLASTULA TO GASTRULA. THE FRACTION S OF ARGININE RICH HISTONE F SUB3 DECREASED IN CONTRAST TO THE AMT. OF THE LYSINE RICH FRACTION WHICH INCREASED. INVESTIGATION OF PRIMEL4 C INCORPORATION INTO HISTONES INDICATED THAT RELATIVE INTENSITY OF HISTONE SYNTHESIS AT BLASTULA AND GASTRULA WAS DIFFERENT. THE SYNTHESIS OF LYSINE RICH FRACTION, THE RELATIVE CONTENT OF WHICH INCREASED AT LATER STAGES OF DEVELOPMENT, WAS DETECTED EVEN IN BLASTULA. THE PROGRESSIVE DECREASE OF ARGININE RICH FRACTIONNS DURING DEVELOPMENT WAS INTERPRETED AS EVIDENCE FOR PARTICIPATION OF HISTONES IN REGULATION OF GENETIC ACTIVITY OF DNA. ELECTROPHORETIC ANAL. HAS SHOWN THAT HISTONES IN LOACH SPERM CONTAINED MORE ARGININE THAN THOSE FROM EMBRYO TISSUES. THE LYSINE RICH FRACTION F SUB1 WAS COMPLETELY ABSENT. AMINO ACID ANAL. INDICATED THAT THE LYSINE-ARGININE RATIO IN SPERM HISTONES WAS 1.5 COMPARED WITH 1.8 IN EMBRYONIC HISTONES. ALSO THE ALANINE CONTENT WAS HIGHER THAN THAT OF ARGININE. ARGININE RICH FRACTIONS OF HISTONE ARE RESPONSIBLE FOR STRUCTURAL CHANGES OF CHROMATIN COMPLEXES. FACILITY: LAB. BIOCHEM. CELL REPROD., INST. CYTOL., LENINGRAD, USSR.

UNCLASSIFIED

Acc. Nr: AP0044384

Ref. Code: UR 0463

PRIMARY SOURCE: Molekulyarnaya Biologiya, 1970, Vol 4, Nr 1, pp 118-128

INVESTIGATION OF HISTONE STRUCTURE

Ramm, Ye. I.; Birshteyn, T. M.; Bolotina, I. A.; Vorob'yev, V. I.; Dmitrenko, L. V.; Nekrasova, T. N.; Vol'kenshteyn, M. V.

Institute of Cytology and Institute of High-Molecular Weight Compounds, Academy of Sciences, USSR, Leningrad and Institute of Molecular Biology, Academy of Sciences, USSR, Moscow

The structure of four histone fractions (f_1, f_2 (*a*), f_2 (*b*), f_3) has been studied by the methods of optical rotatory disperlion, potentiometric titration and viscometry. The analysis of the data obtained made it possible to draw a conclusion that histones are not globular proteins. The dependence of reduced viscosity on the charge of the molecule and the ionic strength of the solution showed that the dimensions of the histone molecules depend to a large extent upon the forces of electrostatic interaction. This suggests that the histone molecules are conformationally flexible and probably exhibit the conformation of a statistical coil with the incorporation of helical regions.

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The potentiometric titration curves have been obtained for all the histone fractions and have been used for calculating the number of ionizable groups, for determining their pK' and the change in the mean overall charge of the molecules with the pH alteration of the medium. The effect of pH and the ionic strength of the solution on the α-helix content of various histone fractions was studied. The data obtained were compared and a conclusion was drawn about the non-uniform distribution of the charged groups in the histone molecules. On one hand, histones contain at neutral pH coil shaped sequences enriched with basic amino acid residues with high density of the positive charge and on the other hand, regions capable to form helical stuctures and containing both acid and basic amino acid residues. A model is proposed describing the structure of histones.

The important differences between histone fractions were shown to exist mainly due to the distribution of the charges along the chain.

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19771001

1/2 016 UNCLASSIFIED PROCESSING DATE--11DEC70

TITLE--THE CONTACT PROBLEM OF AN ELASTIC HALF PLANE TO WHICH IS FIXED A SEMI-INFINITE ELASTIC BAR -U-

AUTHOR-(02)-VOROBYEV, V.L., POPOV, G.YA.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, PRIKLADNAYA MATEMATIKA I MEKHANIKA, NO 2, 70, PP 354-359

DATE PUBLISHED-------70

SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR, MATHEMATICAL SCIENCES

TOPIC TAGS--STRESS ANALYSIS, CONTACT STRESS, ELASTIC PLATE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605041/C03 STEP NO--UR/0040/70/000/002/0354/0359

CIRC ACCESSION NO--AP0142725

UNCLASSIFIED

2/2 018 UNCLASSIFIED

CIRC ACCESSION NO--AP0142725 PROCESSING DATE--11DEC70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CONTACT PROBLEM OF AN ELASTIC SEMI INFINITE PLATE TO WHICH IS FIXED ON ITS ENDS A SEMI INFINITE BAR IS INVESTIGATED FOR THE CASE THAT A UNIT FORCE ACTS ALONG THE AXIS OF THE BAR AT AN ARBITRARY DISTANCE FROM ITS END. THE TANGENTIAL CONTACT STRESS AND THE NORMAL STRESS AT AN ARBITRARY CROSS SECTION OF THE BAR ARE DETERMINED ASSUMING NO BENDING MOMENTS ACTING ON THE BAR AND USING A METHOD PROPOSED BY G. YA. POPOV. FOR SOLVING A SIMILAR PROBLEM WITH A FORCE ACTING PERPENDICULAR TO THE AXIS OF THE BAR AND NEGLECTING THE TANGETIAL CONTACT STRESS. FROM DERIVED INTEGRAL EQUATIONS, VALUES OF THE TANGENTIAL AND NORMAL STRESSES ARE CALCULATED FOR VARIOUS DISTANCES OF THE FORCE FROM THE END OF THE BAR. TABULATED VALUES DEMONSTRATE THAT AT DISTANCES b IS GREATER THAN OR EQUAL TO 1.4 THE STRESSES MAY BE CALCULATED FROM FORMULAS FOR AN INFINITE BAR.

UNCLASSIFIED

1/2 035 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--PROPERTIES OF HIGH RESISTANCE GALLIUM ARSENIDE CONTAINING A TITANIUM IMPURITY -U-

AUTHOR-(05)-VOROBYEV, V.L., GONTAR, V.M., YEGIAZARYAN, G.A., IZERGIN, A.P., MAKAROV, V.V.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TKEH. POLUPROV. 1970, 4(5), 995-7

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--SINGLE CRYSTAL GROWTH, GALLIUM ARSENIDE, TITANIUM, CRYSTAL LATTICE DISLOCATION, CRYSTAL IMPURITY, MANGANESE, IRON, ALUMINUM, MAGNESIUM, NICKEL, COBALT, BISMUTH, CHROMIUM, TIN, SEMICONDICTOR MATERIAL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/0146 STEP NO--UR/0449/70/004/005/0995/0997

CIRC ACCESSION NO--AP0129402

UNCLASSIFIED

2/2 035 UNCLASSIFIED

CIRC ACCESSION NO--AP0129402 PROCESSING DATE--04DEC70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. GAAS SINGLE CRYSTALS WERE GROWN BY THE CZOCHRALSKI METHOD FROM POLYCRYST. GAAS WITH AN ADDN. OF METALLIC TI. THE DISLOCATION D. WAS SMALLER THEN OR EQUAL TO 2 TIMES 10 PRIME4-CM PRIME2, AND THE TI CONTENT WAS SIMILAR TO 10 PRIME18-CM PRIME3. THE CONTENTS OF FE, AL, MG, NI, CO, BI, CR, SN, AND MN WERE 10 PRIME NEGATIVE5-10 PRIME NEGATIVE4 WT. PERCENT, AND THAT OF SE WAS SIMILAR TP 10 PRIME NEAGTIVE3 WT. PERCENT. THE MATERIAL WAS P TYPE, WITH AN ELEC. RESISTIVITY OF SIMILAR TO 10 PRIME2 OHM CM, A FREE CARRIER CONCN. OF 10 PRIME14-10 PRIME15-CM PRIME3, AND A MOBILITY OF 10-100 CM PRIME2-V SEC AT ROOM TEMP. TWO WNERGY LEVELS WERE DETD. FROM THE TEMP. DEPENDENCE OF THE HALL CONST. AND OF THE ELEC. COND. AS 0.35 AND 0.22 EV, RESP.; THE LATTER LEVEL WAS DUE TO THE GA VACANCY. DIODES OF THE P-PI-N TYPE WERE PREPD. FROM THE CRYSTAL, USING SN AS THE INJECTING CONTACT AND AG AS THE NONRECTIFYING ONE. THE AREA OF THE PN JUNCTION WAS 5 TIMES 10 PRIME NEGATIVE3-10 PRIME NEGATIVE2 CM PRIME2. THEIR CURRENT VOLTAGE CHARACTERISTICS AT ROOM TEMP. EXHIBITED A REGION OF NEG. RESISTIVITY, WHICH DISAPPEARED ABOVE 80-90DEGREES AND (OR) IN MAGNETIC FIELDS LARGER THAN OR EQUAL TO 3 KOE. THE NEG. RESISTIVITY IS EXPLAINED AS DUE TO A CHANGE IN THE SCREENING RADIUS OF THE CHARGED IMPURITIES DURING THE INJECTION.

UNCLASSIFIED

Biochemistry

USSR

UDC 577.1:615.7/9

KUDRIN, A. N., VOROB'YEV, V.G.M.

"Amino Ketones (Experimental and Clinical Studies)"

Meditsina (Medicine), 1970, 327 pp, ill., 1 r. 86 k. (from Referativnyy Zhurnal - Biologicheskaya Khimiya, No 14, 25 Jul 70, Abstract No 14 F1937)

Translation: A generalized account of the biological, pharmacological, and clinical work in the study of new, active amino ketone agents is presented in this book. In the amino ketone series were obtained active adrenolytic, spasmolytic, antiangiotensin, antiarythmic and neurotropic agents. A classification of amino ketones based on pharmacological principles is proposed. Data are given which show the relationship between the chemical structure and pharmacological and toxicological activity of these materials.

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N. A. Ugoleva

USSR

UDC: 681.3.06:51

VOROB'YEV, V. M., GOGINA, M. A., KONONENKO, I. A., and CHISTOV, V. P.

"Programming System of the Extended FORTRAN Language for the BESM-8 Computer"

Sb. nauch. tr. Chelyabinsk. politekhn. in-ta (Collection of Scientific Works of the Chelyabinsk Polytechnical Institute) No 138, 1973, pp 93-98 (from RZh--Avtomatika, telemekhanika i vychislitel'naya tekhnika, No 12, 1973, Abstract No 12B151)

Translation: The purpose of extending the FORTRAN language was to create a non-machine-oriented language for recording algorithms of symbolic and digital information permitting the use of a language translator in all machines with a minimum of construction. It was also proposed to provide a succession of algorithms written in the LYaPAS language and an absorption of the broadened language by languages of higher level -- the PL/1 language, for example.

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USSR

VOROB'YEV, V. M., et al., Sb. nauch. tr. Chelyabinsk. politekhn. in-ta, No 138, 1973, pp 93-98

This last language could not be fully realized due to a number of syntactical and semantic contradictions in the FORTRAN and LYaPAS languages. It is noted that the essential characteristic of the extended language is the possibility of using it in operands of "lines of symbols" and "lines of bits" of arbitrary length. This required taking special measures for considering the effect of changes in the operand length of the computation process.

In a version in which the length of the operands may be equal to the length of the machine word there is no need for this consideration, and the translated programs are done faster. Compound names used for the formation of "cut-ins" and "cut-outs" and "lines of bits" and "lines of symbols" are introduced into the extended language. The principles for the construction of the translator and for the translation of R text into F text are given. Organization of the translation system is described. N. V.

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EQUIPMENT
Gyroscopic

USSR

UDC 531.36

GANIYEV, R. F., LYUTYY, A. I., VOROB'YEV, V. M.

"On the Stability of Gyroscopic Systems Under Resonance Conditions"

V sb. Konf. po kolebaniyam mekh. sistem. Tezisy dokl. (Conference on Oscillations of Mechanical Systems. Abstracts of the Reports), Kiev, "Nauk. dumka", 1971, p 23 (from RZh-Mekhanika, No 10, Oct 71, Abstract No 10A225)

Translation: An investigation is made of the effect which angular and translational vibrations of the base have on the stability of motion of gyroscopic systems under resonance conditions. Investigations are made of the stability of the equilibrium position of a double-axle gyroframe, an astatic gyroscope, a heavy gyroscope with horizontal suspension shaft of the outer ring, and also the stability of pseudoregular precession of a heavy gyroscope in which the axis of the outer ring suspension is vertical.

The velocities of systematic drifts are calculated, and conditions of stability at resonance are found. It is shown in particular that the most dangerous perturbations of the base which increase the amplitude of

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USSR

GANIYEV, R. F., et al., Konf. po kolebaniyam mekh. sistem. Tezisy dokl., Kiev, "Nauk. dumka", 1971, p 23

nutational vibrations are the angular vibration of the base relative to the axis coinciding at time zero with the axis of proper rotation of the rotor, and also translation vibration along the axis of rotation of the rotor.

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USSR

UDC 621.375.426

SIMONOV, YU. L., VOROB'YEV, V. N. [Members, Scientific-Technical Society Of Radio Engineering, Electronics, And Communications imeni A.S. Popov]

"Distribution Of Attenuation Equivalents And Generalized Misalignments In Single-Circuit IF Amplifiers With Staggered Stages With Critical Misalignment"

Radiotekhnika, Vol 27, No 4, Apr 1972, pp 57-60

Abstract: General computed relations are obtained in the case of critical misalignment for the attenuation equivalents of circuits, generalized misalignments, and the functions $\chi_U(n)$ and $\psi_U(n)$ of an intermediate frequency amplifier with an arbitrary number N of identical groups of staggered stages (each group includes U staggered stages; the overall number of stages of the amplifier $n = NU$). 1 tab. 2 ill. 5 ref. Received, 4 May 1970; after further improvement, 9 Dec 1970.

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USSR

UDC 621.382.2

VOROBIYEV, V. N., ETKIN, V. S.

"Investigation of the Gunn Effect In A Magnetic Field"

Tomsk, V sb. Arsenid galliya (Gallium Arsenide --- Collection of Works), Issue 3, Tomsk University, 1970, pp 266-271 (from RZh-Elektronika i yeye primeneniye, No 3, Mar 71, Abstract No 3B146)

Translation: An investigation is described of the character of the spectra and the power of the oscillations which are generated by specimens of GaAs in a transverse magnetic field. It is established that with a fixed orientation of a specimen, inclusion of a magnetic field increases the coherence and output power of the Gunn oscillations. A rule connected with the geometry of the specimen and its orientation in the magnetic field was not established. 5 ill., 2 ref. B.M.

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1/2 033 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--INFLUENCE OF A MAGNETIC FIELD ON LOW FREQUENCY VIBRATIONS DURING THE GUNN EFFECT -U-

AUTHOR--VOROBYEV, V.N.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(5), 944-5

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--LOW FREQUENCY, VIBRATION, GALLIUM ARSENIDE, ULTRAHIGH FREQUENCY, MAGNETIC FIELD

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3007/0895 STEP NO--UR/0449/70/004/005/0944/0945

CIRC ACCESSION NO--AP0136329

UNCLASSIFIED

2/2 033 UNCLASSIFIED PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0136329

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. LOW FREQUENCY OSCILLATIONS IN SPECIMENS OF GAAS (CONCN. 3.9 TIMES 10 PRIME14 CM PRIME NEGATIVE3 AND MOBILITY 5000 CM PRIME2-V SEC.) IN A TRANSVERSE MAGNETIC FIELD ARE INVESTIGATED. WITH APPLIED VOLTAGE GREATER THAN THE THRESHOLD, APPLICATION OF A TRANSVERSE MAGNETIC FIELD OF 5000 G PRODUCES LOW FREQUENCY OSCILLATIONS OF 77 MHZ. THE THRESHOLD VOLTAGE, AS ALSO THE AMPLITUDES OF THE LOW AND ULTRAHIGH FREQUENCY OSCILLATIONS, DEPENDS ON THE ORIENTATION OF THE SPECIMEN WITH RESPECT TO THE MAGNETIC FIELD.

FACILITY: MOSK. GOS. PEDAGOG. INST. IM. LENINA, MOSCOW, USSR.

UNCLASSIFIED

Extraction and Refining

USSR UDC 669.782.018.9.4(088.8)

YEFREMKIN, V. V., and VOROB'YEV, V. P.

"Method of Refining Silicon Alloys"

USSR Author's Certificate No 258344, filed 19-11-68, published 30-04-70, (from Referativnyy Zhurnal-Metallurgiya, No 1, 1971, Abstract No 1 G165 P)

Translation: A method is suggested for refining silicon alloys consisting in an introduction of refining additives to the metal. In order to remove Al from the alloys, Ni-containing materials are introduced to the metals in quantities sufficient to bond the Al into intermetallic Al-Ni system compounds.

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1/2 014 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--EFFECT OF ORIENTATION ON THE ELECTRICAL STRENGTH OF POLYMER FILMS -U-

AUTHOR-(05)-ROMANOVSKAYA, O.S., SHCHERBAK, P.N., VORDBYEV, V.P., YARTSEVA, E.E., SHPAKOVSKAYA, G.B.

COUNTRY OF INFO--USSR

SOURCE--VYSOKOMOL. SOEDIN. SER. B 1970, 12(1), 27-31

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--POLYSTYRENE RESIN, COPOLYMER, PLASTIC FILM, ELECTRIC PROPERTY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1984/0927 STEP NO--UR/0460/70/012/001/0027/0031

CIRC ACCESSION NO--AP0055625

UNCLASSIFIED

2/2 014 UNCLASSIFIED PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0055625

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE INCREASE OF POLYSTYRENE (I) OR STYRENE-ALPHA-METHYLSTYRENE COPOLYMER (II) FILM ORIENTATION, AS INDICATED BY THE INCREASE IN THE BIREFRINGENCE SMALLER THAN OR EQUAL TO 5 TIMES 10 PRIME NEGATIVE3, ALSO INCREASES THE ELEC. BREAKDOWN VOLTAGE (E) 30-50PERCENT. A FURTHER INCREASE IN THE ORIENTATION HAS NO EFFECT ON THE E OF II AND DECREASES THE E OF I.

UNCLASSIFIED

Acc. Nr. AA0108167 Abstracting Service: CHEMICAL ABST. 6-70 Ref. Code UR 0482

134782b **Briquets for silicocalcium production.** Kozhevnikov, G. N.; Nefedov, P. Ya.; Vorob'ev, V. P.; Ryss, M. A.; Getmanchuk, V. M.; Zaiko, V. P.; Belyaev, G. S.; Mikulinskii, A. S. (Ural Institute of Metallurgy, Academy of Sciences, U.S.S.R.) U.S.S.R. 260,653 (Cl. C 21c), 06 Jan 1970, Appl. 25 Feb 1969; From *Otkrytiya, Izobret., Prom. Obraztsy, Tovarnye Znaki* 1970, 47(4), 26. Briquets for silicocalcium production were made from lime 60–70 and a carboniferous reducing agent 30–40 wt. % to reduce the losses of Si and the consumption of charge materials.

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REEL/FRAME

19891833

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UDC [621.362:538.4]-225.98.001.24

VOROB'YEV, V. S., KRASNOV, V. I.

"Optimization of the Channel Parameters of a Closed Cycle Magnetohydrodynamic Generator"

Teplofiz. vysokikh temperatur (Thermophysics of High Temperatures), 1971, Vol 9, No 1, pp 165-169 (from RZh-Elektrotekhnika i energetika, No 7, Jul 71, Abstract No 7A89)

Translation: The local internal efficiency of a magnetohydrodynamic generator channel (η_0) was optimized with respect to the proportion of the addition (Δ), the Mach number (M), the electron temperature at the given level of conductivity, the magnetic field induction, the braking parameters of the flux and its composition. The problem of the conditional extremum is reduced to solving a system of two algebraic equations which for a given type of addition depend on two parameters which are a combination of the initial variables. Graphs are presented which permit selection of the optimal Δ, M, T_e insuring the maximum η_0 under a broad range of conditions for different additions and inert gases. There are 4 illustrations, 2 tables and a 3-entry bibliography. [High Temperature Institute of the USSR Academy of Sciences].

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USSR

UDC 535.33

AVILOVA, I. V., BIBERMAN, L. M., VOROB'YEV, V. S., ZAMALIN, V. M., KOBZEV, G. A., MNATSAKANYAN, A. KH., and NORMAN, G. E., Institute of High Temperatures of the Academy of Sciences USSR

"Optical Properties of Hot Gases. CO_2 + N_2 Mixture"

Moscow, Teplofizika Vysokikh Temperatur, Vol. 8, No. 1, Jan/Feb 70, pp 1-11

Abstract: Elementary radiation processes associated with the presence of carbon atoms, either free or in molecules, in planetary atmospheres are studied. Certain spectral and integral characteristics of CO_2 and N_2 mixtures are calculated and compared. Particular attention is given to the composition 90% CO_2+ + 10% N_2, which approximately corresponds to the atmosphere of Venus according to data from "Venera-4" and "Mariner-5". Computer programs and a computational technique developed earlier by the authors were used to obtain absorption cross sections for processes associated with atomic hydrogen in CO_2 + N_2 mixtures. The absorption cross sections of CN, CO, CO^+, and C_2 are given for the temperatures 4000, 8000, and 12,000°K. The degree of blackness ε, the Rosseland average A, and the Planck average B were calculated for T = (6-10)·10^3°K and P = 0.1-10 at.

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USSR

AVILOVA, I. V., et al, Teplofizika, vysokikh temperatur, Vol. 8, No. 1, Jan/Feb 70, pp 1-11

A comparison with experimental data showed that the authors' method of tabulating optical properties of hot gases is applicable to $CO_2 + N_2$ mixtures and produces satisfactory accuracy. From the gas dynamics aspect, the calculations show that radiation transfer plays a considerable role in entry into planetary atmospheres. It is pointed out that the degree of blackness of the mixture studied here is considerably greater than that of air and that the difference is especially great in relatively low temperatures.

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1/2 051 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--MONTE CARLO STUDY OF AN EQUILIBRIUM NONIDEAL PLASMA -U-

AUTHOR-(03)-VOROBYEV, V.S., NORMAN, G.E., FILINOV, V.S.

COUNTRY OF INFO--USSR

SOURCE--PRIKL. SPEKTROSK. 1970, 12(3), 399-402 (RUSS)

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--MONTE CARLO METHOD, COULOMB INTERACTION, PARTICLE MOTION, QUANTUM MECHANICS, MARKOV PROCESS, HYDROGEN PLASMA, DENSE PLASMA, CORRELATION FUNCTION, THERMODYNAMIC PROPERTY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1996/1488 STEP NO--UR/0368/70/012/003/0399/0402

CIRC ACCESSION NO--AP0118475

UNCLASSIFIED

2/2 051 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0118475

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A MONTE CARLO (MC) STUDY WAS MADE OF A NONDEGENERATE PLASMA. THE QUANTUM EFFECTS OF INTERACTION WERE TAKEN INTO ACCOUNT BY REPLACEMENT OF THE COULOMB POTENTIAL BY A PSEUDOPOTENTIAL AT SMALL DISTANCES. THE PSEUDOPOTENTIAL WAS DETD. FROM QUANTUM MECH. CONSIDERATION OF THE MOTION OF 2 CHARGED PARTICLES. THE LIMITS OF THAT MODEL ARE DISCUSSED. THE COMPARATIVELY SHORT MARKOV CHAINS (10 PRIME4) WERE USED. THE NO. OF PARTICLES IN THE MC CELL WAS ONLY 30-40. THE THERMODYNAMIC PROPERTIES AND CORRELATION FUNCTION WERE CALCD. FOR VERIFICATION OF THE METHOD USED, THE CALCN. FOR A NEARLY IDEAL PLASMA OF H ATOMS WAS MADE, AND THE RESULTS WERE GOOD. FOR A DENSE H PLASMA AT 30,000DEGREESK, THE IONIZATION DEGREE WAS 0.4 AT GAMMA EQUALS 1 AND IS SMALLER THAN 0.2 AT GAMMA EQUALS 2, WHERE GAMMA IS THE INTERACTION PARAMETER OF FREE CHARGES.

UNCLASSIFIED

VOROB'YEV, V.S.

Psychiatry

JPRS 57716

8 December 1972

UDC 616.831.3-091-02:615.214.2

THE DYNAMICS OF PATHOMORPHOLOGICAL CHANGES IN THE CEREBROCORTICAL MOTOR REGION IN RESPONSE TO A SINGLE LYSERGAMIDE (LSD) ADMINISTRATION (AN ELECTRON MICROSCOPIC INVESTIGATION)

[Article by V.F. Matveyev and V.S. Vorob'yev, Department of Psychiatry, Moscow Medical Stomatological Institute; Moscow, Zhurnal Nevropatologii i Psikhiatrii, Russian, No 7, 1972, pp 1071-1076]

Ultrastructural changes in various cellular components of the cerebral cortex in rats after injection of 40 micrograms/kg LSD are described. Observations were made 1, 4, 8, 12, and 24 hours after the drug was injected. Swelling of neurons and astrocytes, sharp changes in the condition of the granular reticulum and ribosomes (their quantity was reduced), and in mitochondrial structure, swelling of vascular walls, and changes in synapse structure were typical responses to LSD. These changes were most highly pronounced after 4-8 hours. A return to normal conditions was noted after 12-24 hours.

Investigation of the way psychomimetic drugs affect the brain in experiments on animals is of great importance to the study of the pathogenesis of psychiatric disturbances in humans. When psychoses, particularly those generated by LSD, are modeled in animals, physiological, neurophysiological, and morphological investigation methods are employed. However, the action of lysergic acid and its derivatives on the brain has not been studied adequately yet with morphological methods. Such studies are relatively few in number. Some of them deal with relatively narrow problems, for example just changes in the cell body or synaptic changes. Moreover, as a rule the studies were limited to the one-time action of large LSD doses that cause severe toxicosis in experimental animals. In these

Pulse Technique

UDC 678.02:66.097

USSR

ABRAMYAN, Ye. A., VOROB'YEV, V. V., YEGOROV, A. A., YELKIN, V. A., and PONOMARENKO, A. G.

"Initiating the Discharge in a Megavolt Gas Space by an Electron Beam"

Moscow, Pribory i tekhnika eksperimenta, No. 1, January-February, 1971, pp 117-118

Abstract: This paper describes the experimental method and results in the use of an electron beam to start the discharge in a gaseous gap. The high voltage of 0.2 to 1 MV is supplied by a Tesla induction transformer, with the capacitance formed by the transformer electrode and the transformer's grounded casing playing the part of the discharge gap. This casing is filled with gas at a pressure of 12 atmospheres, with the electron beam injected, with an energy of 150 to 400 kev and a current of 10 A in the course of 5 ns, into the center of the gap, which has a length of 4 cm. The injection is made through a 1-cm diameter window of fine foil. A sketch of this equipment is provided. Photographs of the discharge are reproduced.

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USSR

VOROB'YEV, V. V.

UDC: 621.378.9:551.51

"Effect of Heating of a Turbulent Atmosphere by a Light Beam on the Fluctuation of its Intensity"

Moscow, Kvantovaya elektronika, No 7, 1972, pp 5-13

Abstract: Since the dielectric permeability of air is an inverse function of the temperature, an increase in the temperature causes a drop in the permeability. If the temperature increase is caused by a light beam, a change in the index of refraction may cause a reaction in the beam. For a regular medium, this reaction may be a turn of the beam toward the wind or a change in focusing. For a turbulent medium, the reaction may be a change in the variation of the light field. In this paper, the author considers the dispersion in wide beams to be such that the stationary temperature profile is due to removal by the wind of the heat from the beam. Additional fluctuations of temperature in the medium when it is heated by the light beam may be caused by disturbances in the beam or by nonuniformity of the heating connected with the fluctuation of the light field. The author computes the functions connected with such disturbances, when velocity fluctuations also exist, with a simplifying assumption concerning the beam dispersion, and then turns to

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USSR

VOROB'YEV, V. V., Kvantovaya elektronika, No 7, 1972, pp 5-13

the nonuniform heating of the medium as the result of changes in the light field. It is noted that the effect is marked in the propagation of light pulses too if their energy exceeds the critical energy of the defocusing. The author expresses his gratitude to V. I. Tatarskiy for his assistance with the work, and to A. S. Gurvich and S. A. Akhmanov for their discussion of the results.

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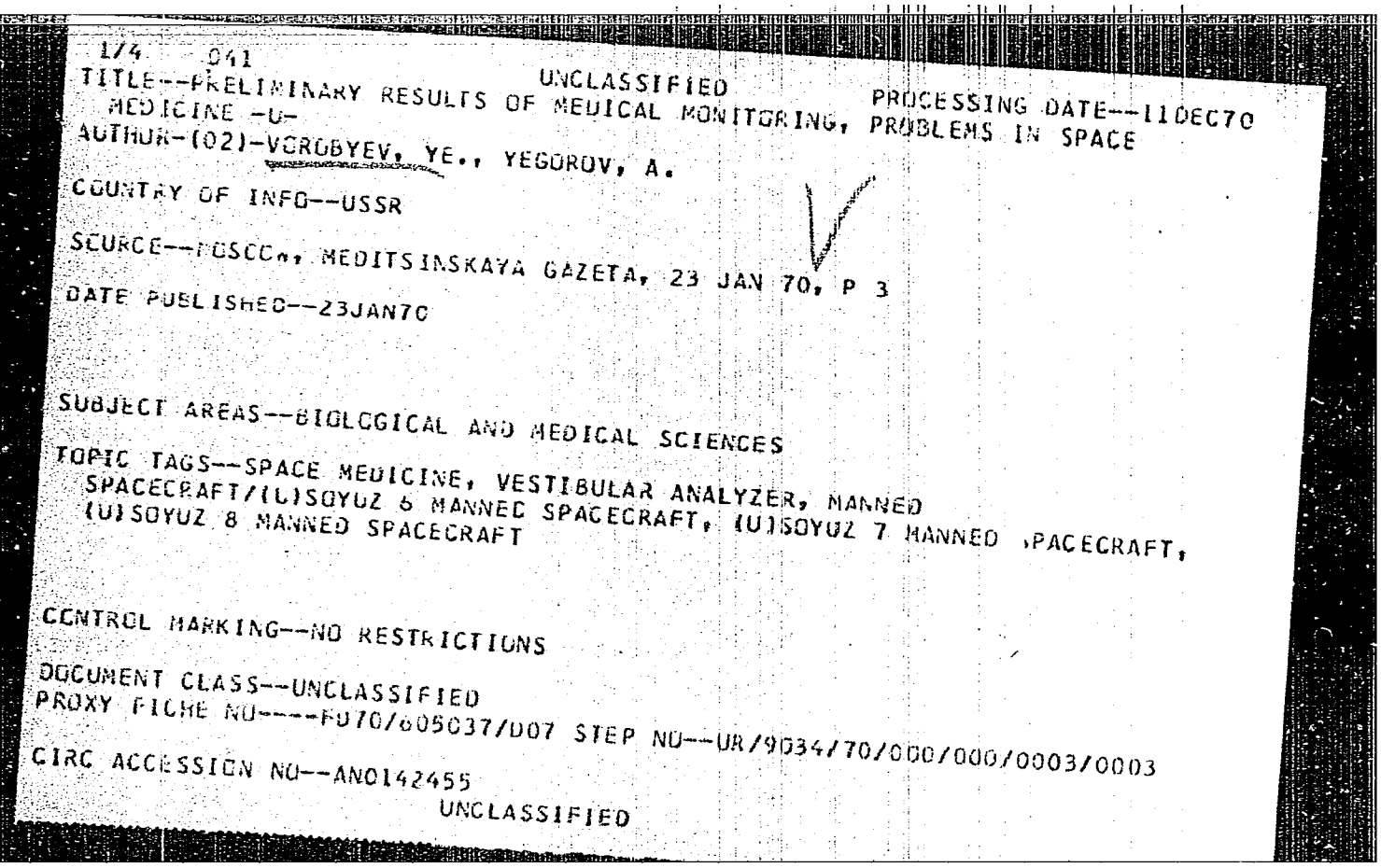

1/4 041 UNCLASSIFIED PROCESSING DATE--11DEC70
TITLE--PRELIMINARY RESULTS OF MEDICAL MONITORING, PROBLEMS IN SPACE MEDICINE -U-
AUTHOR-(02)-VOROBYEV, YE., YEGOROV, A.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, MEDITSINSKAYA GAZETA, 23 JAN 70, P 3

DATE PUBLISHED--23JAN70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--SPACE MEDICINE, VESTIBULAR ANALYZER, MANNED SPACECRAFT/(U)SOYUZ 6 MANNED SPACECRAFT, (U)SOYUZ 7 MANNED SPACECRAFT, (U)SOYUZ 8 MANNED SPACECRAFT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY FICHE NO----FD70/005037/D07 STEP NO--UR/9034/70/000/000/0003/0003

CIRC ACCESSION NO--AN0142455
UNCLASSIFIED

2/4 041 UNCLASSIFIED

CIRC ACCESSION NO--AN0142455 PROCESSING DATE--11DEC70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DURING THE FLIGHT OF THE SPACE FLEET CONSISTING OF SOYUZ-6, SOYUZ-7, AND SOYUZ-8, A NUMBER OF MEDICAL EXAMINATIONS WERE CONDUCTED, WITH CONTINUOUS MEDICAL MONITORING OF THE CONDITION OF THE CREW. THE CHARACTERISTIC FEATURE OF FLIGHT FROM THE MEDICAL POINT OF VIEW IS THE ABILITY TO DETECT GENERAL PATTERNS OF CHANGE IN PHYSIOLOGICAL PROCESSES UNDER THE EFFECT OF FLIGHT FACTORS IN SEVEN COSMONAUTS AT THE SAME TIME. ALSO, THEIR PRESENCE IN THE SAME SPACECRAFT MAKES IT POSSIBLE TO ASSESS THE INDIVIDUAL CHARACTERISTICS OF EACH ONE, WHICH IS EXTREMELY IMPROTANT FOR DEVELOPING SELECTION CRITERIA AND FOR FORECASTING CHANGES IN PHYSIOLOGICAL REACTIONS DURING SAPCE FLIGHTS. IT MUST BE NOTED THAT THE CREW MEMBERS OF SOYUZ-8, V. SHATALOV AND A. YELISEYEV, WERE ON THEIR SECOND SPACE FLIGHT. THIS PERMITS MORE THOROUGH INVESTIGATION OF ADAPTATION OF THE HUMAN ORGANISM TO SPACEFLIGHT CONDITIONS, IN PARTICULAR TO WEIGHTLESSNESS. FINALLY, ONE OF THE MEDICAL TASKS WAS TO INVESTIGATE INFLIGHT PSYCHOPHYSIOLOGICAL CAPABILITIES AND PHYSIOLOGICAL REACTIONS WHEN PERFORMING DYNAMIC OPERATIONS RELATED TO MANEUVERING AND MANUAL CONTROL OF SAPCECRAFT. THE ENTIRE SET OF EXAMINATIONS AND OBSERVATIONS WAS DIRECTED TOWARD PERFORMING TWO EXTREMELY IMPROTANT TASKS. THE FIRST TASK WAS MEDICAL MONITORING OF THE PHYSICAL CONDITION OF THE CREW DURING FLIGHT INCLUDING, IF NECESSARY, RECOMMENDATIONS FOR THE PREVENTION OF POSSIBLE CHANGES IN PHYSIOLOGICAL FUNCTIONS AND FOR THE TREATMENT OF DISEASE. THE SECOND TASK WAS INVESTIGATIONS OF THE EFFECT OF SPACE FLIGHT FACTORS ON THE HUMAN ORGANISM.

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ABSTRACT/EXTRACT--DIVERSE SOURCES OF INFORMATION WERE USED TO EVALUATE THE PHYSICAL CONDITION OF COSMONAUTS. THE MOST IMPROTANT WERE DATA OBTAINED DURING RADIO COMMUNICATION AND TELEVISION; ANALYSIS OF PERFORMANCE OF FLIGHT ASSIGNMENTS AND RECORDED PHYSIOLOGICAL PARAMETERS AND INDICES OF THE MICROCLIMATE IN THE MANNED CABINS OF SPACECRAFT. DURING FLIGHT, PULSE RATE WAS RECORDED CONTINUOUSLY, AND, WHEN THE CRAFT WAS WITHIN THE RANGE OF EARTH BOUND MONITORING POINTS, ELECTROCARDIOGRAPHY, SEISMOCARDIOGRAPHY AND PNEUMOGRAPHY WERE PERFORMED PERIODICALLY. THE INFORMATION ABOUT THE PHYSICAL CONDITION OF CREW MEMBERS WAS PROCESSED COMPUTER AND WAS CONTINUOUSLY FED TO THE FLIGHT COMMAND CENTER, WHERE IT WAS ANALYZED BY HIGHLY QUALIFIED MEDICAL SPECIALISTS. THE PHYSICIANS WERE READY TO RENDER EMERGENCY "SPACE" AID TO THE CREW AT ANY MOMENT. FOR THIS PURPOSE THERE WAS A DRUG KIT ON BOARD WHICH CONTAINED NOT ONLY MEDICATION FOR INGESTION, BUT ALSO TUBE SYRINGES FOR INJECTIONS. HOWEVER, THE NEED DID NOT ARISE FOR THIS KIT SINCE THE CRE. FELT FINE THROUGHOUT THE FLIGHT. SCIENTIFIC MEDICAL EXAMINATIONS DURING FLIGHT INCLUDED INVESTIGATION OF FUNCTIONS OF THE VESTIBULAR AND VISUAL ANALYZERS, REACTIONS OF THE CARDIOVASCULAR SYSTEM TO PHYSICAL LOADS, AND OTHER INDICES. ALL OF THE PLANNED MEDICAL EXPERIMENTS WERE COMPLETED. THE MICROCLIMATE PARAMETERS IN THE MANNED CABINS OF THE CRAFT WEREWITHIN THE PRESENT RANGE AND WERE COMFORTABLE FOR THE CREW MEMBERS. THE SPACEFLIGHT WERE ASSOCIATED WITH GOOD RADIATION CONDITIONS: TOTAL IRRADIATION DOSAGE WAS CONSIDERABLY SMALLER THAN ESTIMATED AND HUNDREDS OF TIEMS LOWER THAN THE PERMISSIBLE THRESHOLDS.

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ABSTRACT/EXTRACT--THUS, THE CONDITION OF THE COSMONAUTS WAS GOOD THROUGHOUT THE FLIGHT, AND THEIR EFFICIENCY REMAINED UNIMPAIRED, SO THAT THE FLIGHT PROGRAM COULD BE FULFILLED. THE MAIN PHYSIOLOGICAL INDICES WERE WITHIN NORMAL RANGE AFTER ADAPTATION TO THE FLIGHT, WHICH LASTED FOR SEVERAL HOURS. THE GENERAL PATTERNS OF THE DAILY RHYTHM WERE INTACT. PERFORMANCE OF NUMEROUS MANEUVERS DID NOT VISIBLY AFFECT THE DYNAMICS OF PHYSIOLOGICAL INDICES. THE FIRST POSTFLIGHT EXAMINATION ALSO FAILED TO DEMONSTRATE ANY DEVIATIONS IN THE COSMONAUTS' HEALTH. AT THE PRESENT TIME ALL THE CREW MEMBERS AHVE UNDERGONE A THOROUGH MEDICAL EXAMINATION AND ARE FEELING WELL. UNLIKE PREVIOUS FLIGHTS, THE COSMONAUTS FOOD CONSISTED OF UNADULTERATED FOOD SELECTED WITH DUE CONSIDERATION OF INDIVIDUAL TASTES. THE MENU WAS DIVERSE AND INCLUDED FOUR KINDS OF BREAD, MEATS JUICES, ETC. SCIENTISTS HAVE ALREADY BEGUN MAKING A COMPREHENSIVE ANALYSIS OF THE DATA OBTAINED. ACCORDING TO THE PRELIMINARY RESULTS, IT HAS BEEN ESTABLISHED THAT THE PHYSIOLOGICAL INDICES OF THE COSMONAUTS SHOWED SHIFTS CONSISTENT WITH THE OPERATIVE SPACE FACTORS. IN THE SEGMENT OF FLIGHT INVOLVING ENTRY INTO ROBIT, THERE WAS SOME INCREASE IN HEART RATE RELATED TO THE EFFECT OF ACCELERATIONS. THE COSMONAUTS ADAPTED TO SPACEFLIGHT CONDITIONS WITHIN THE FIRST 4-6 HOURS OF FLIGHT. FROM THIS TIME ON, THE PHYSIOLOGICAL INDICES WERE ALMOST THE SAME AS THOSE OBSERVED IN TESTS ON EARTH SEVERAL WEEKS PRIOR TO FLIGHT. THE MEAN PULSE RATE RANGED FROM 60 TO 80 PER MINUTE, INCREASING SOMEWHAT WHEN PERFORMING COMPLEX MANEUVERS OR IMPORTANT EXPERIMENTS. THERE WAS A VISIBLE DECREASE IN PULSE RATE DURING SLEEP.

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Aerospace Medicine

USSR

VOROB'YEV, YE., Doctor of Medical Sciences, and YEGOROV, A., Candidate of Medical Sciences

"Preliminary Results of Medical Monitoring -- Problems in Space Medicine"

Moscow, Meditsinskaya Gazeta, 23 Jan 70, p 3

Translation: During the flight of the space fleet consisting of Soyuz-6, Soyuz-7, and Soyuz-8, a number of medical examinations were conducted, with continuous medical monitoring of the condition of the crew. The characteristic feature of flight from the medical point of view is the ability to detect general patterns of change in physiological processes under the effect of flight factors in seven cosmonauts at the same time. Also, their presence in the same spacecraft makes it possible to assess the individual characteristics of each one, which is extremely important for developing selection criteria and for forecasting changes in physiological reactions during space flights.

It must be noted that the crew members of Soyuz-8, V. Shatalov and A. Yeliseyev, were on their second space flight. This permits

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more thorough investigation of adaptation of the human organism to spaceflight conditions, in particular to weightlessness.

Finally, one of the medical tasks was to investigate inflight psychophysiological capabilities and physiological reactions when performing dynamic operations related to maneuvering and manual control of spacecraft.

The entire set of examinations and observations was directed toward performing two extremely important tasks. The first task was medical monitoring of the physical condition of the crew during flight including, if necessary, recommendations for the prevention of possible changes in physiological functions and for the treatment of disease. The second task was investigations of the effect of space flight factors on the human organism.

Diverse sources of information were used to evaluate the physical condition of cosmonauts. The most important were data obtained during radio communication and television, analysis of performance of

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VOROB'YEV, YE., et al., Moscow, Meditsinskaya Gazeta, 23 Jan 70, p 3

flight assignments and recorded physiological parameters and indices of the microclimate in the manned cabins of spacecraft. During flight, pulse rate was recorded continuously, and, when the craft was within the range of earth-bound monitoring points, electrocardiography, seismocardiography and pneumography were performed periodically. The information about the physical condition of crew members was processed computer and was continuously fed to the flight command center, where it was analyzed by highly qualified medical specialists.

The physicians were ready to render emergency "space" aid to the crew at any moment. For this purpose there was a drug kit on board which contained not only medication for ingestion, but also tube syringes for injections. However, the need did not arise for this kit since the crew felt fine throughout the flight.

Scientific medical examinations during flight included investigation of functions of the vestibular and visual analyzers, reactions of the cardiovascular system to physical loads, and other indices. All of the planned medical experiments were completed.
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Unlike previous flights, the cosmonauts food consisted of unadulterated food selected with due consideration of individual tastes. The menu was diverse and included four kinds of bread, meats juices, etc.

Scientists have already begun making a comprehensive analysis of the data obtained. According to the preliminary results, it has been established that the physiological indices of the cosmonauts showed shifts consistent with the operative space factors. In the segment of flight involving entry into orbit, there was some increase in heart rate related to the effect of accelerations. The cosmonauts adapted to spaceflight conditions within the first 4-6 hours of flight. From this time on, the physiological indices were almost the same as those observed in tests on earth several weeks prior to flight. The mean pulse rate ranged from 60 to 80 per minute, increasing somewhat when performing complex maneuvers or important experiments. There was a visible decrease in pulse rate during sleep.

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The microclimate parameters in the manned cabins of the craft were within the preset range and were comfortable for the crew members. The spaceflight were associated with good radiation conditions: total irradiation dosage was considerably smaller than estimated and hundreds of times lower than the permissible thresholds.

Thus, the condition of the cosmonauts was good throughout the flight, and their efficiency remained unimpaired, so that the flight program could be fulfilled. The main physiological indices were within normal range after adaptation to the flight, which lasted for several hours. The general patterns of the daily rhythm were intact. Performance of numerous maneuvers did not visibly affect the dynamics of physiological indices.

The first postflight examination also failed to demonstrate any deviations in the cosmonauts' health. At the present time all of the crew members have undergone a thorough medical examination and are feeling well.
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VOROBIYEV, YE. A.

RADAR ENGINEERING

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APPRAISAL OF EFFECT OF EXTERNAL NOISE UPON ANGULAR RESOLUTION OF HIGHLY DIRECTIONAL ANTENNAS

[Article by Ye. A. Vorob'yev; Kiev, Radioelektronika, Russian, Vol 10, No 5, 1967, pp 473-474]

Highly directional antennas of radar stations of detection and tracking of ground, water, and low flying targets operate in high-level external noise. For the above-mentioned type of radar antennas, the high level of external noise is due basically to the diffusion radiation of soil or water surface and to the effect of radome.

An established dependence [1] connecting the mean-square angular error σ_{θ° of the antenna with the signal/noise ratio $(N/P_{ш A})$

$$\sigma_{\theta^\circ} \approx \frac{p\lambda_0}{L\sqrt{N/P_{шA}}} \ рад, \qquad (1)$$

where λ_0 is the operational wavelength; L is the linear antenna size in the plane of error determination; and p is the coefficient of the effective antenna area.

A well-known relation between noise power, Boltzmann's constant B, transmission band Δf, and the structure temperature (Kelvin) T_A

$$P_{шA} = B\Delta f T_A. \qquad (2)$$

In its turn, the effective antenna temperature is equal to the sum of partial components

$$T_A = T_{oc} + T_з + T_{e.п} \qquad (3)$$

corresponding to the following noise sources: T_{oc} -- temperature of the surrounding medium; $T_з$ -- temperature

determined by the picked-up ground or water surface radiation noise; $T_{об}$ -- temperature of the noise component due to radome.

Also, [2]:

$$T_{ф} \approx KY_{бок.лен}(1+a)\,T_{пов}, \qquad (4)$$

where $KY_{бок.лен}$ -- is the main coefficient of side lobe gain, applicable to the reception of diffused radiation from the ground or water surface; a is the reflection coefficient from ground or water; $T_{пов}$ is the temperature of ground or water surface.

$$T_{об} \approx \frac{1}{a_{об}}(a_{об}-1)\,T_{ср} \qquad (5)$$

In the last equation a_{on} is the attenuation in the radome wall for the normal angle of incidence and the half-wave wall, having a dielectric constant ε_a and the dielectric loss factor tan δ_ε

$$a_{on} \approx \frac{\pi}{2}\left[\sqrt{\varepsilon_a}+\frac{1}{\sqrt{\varepsilon_a}}\right]\operatorname{tg}\delta_\varepsilon. \qquad (6)$$

For the known receiver noise factor Ш the effective noise temperature of the latter, $T_{пр}$, is computed from the simple formula

$$T_{пр} \approx (Ш-1)\,290^\circ K. \qquad (7)$$

One may assume that the presence of antenna noise may lead only to the reduction of angular resolution. This is equivalent to a certain effective broadening of the main lobe $\theta^0_{эфф}$ with respect to the theoretical θ^0_T. Because of this

$$\theta^0_{эфф} < \theta^0_T + a_{ош}.$$

We shall examine an example. Let $\lambda_0 = 3$ cm and Ш $\approx$ 1.2. Then $T_{пр} \approx 59^\circ K$; for a radome with $\varepsilon_a \approx 9$ and tan $\delta_\varepsilon = 0.1$, we obtain $a_{on} = 0.5$; assuming $KY_{бок.лен} = -13$ db, $a = 0.3$, $T_{пов} = 300^\circ K$, computation according to formula (4) gives $T_{ф} \approx 10^\circ K$. Substituting numerical values of a_{oc}

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VOROB'YEV, Ye. A.

"Problems and Prospects of Predicting the Parameters of Microwave Dielectrics in the Case of Thermal Shock and Very High Temperatures. (A Survey)"

Tr. Leningr. in-t aviats. priborostr. (Works of the Leningrad Institute of Aircraft Instrument Building), 1971, vyp. 70, pp 24-32 (from RZh-Radiotekhnika, No 8, Aug 71, Abstract No 8A303)

Translation: The author considers the state of the art of measurement of the static and dynamic temperature dependences of the parameters of microwave dielectrics; a method is described for measuring the radio engineering parameters, and prospects are discussed for the prediction of parameters of dielectrics at very high temperatures and in the case of thermal shock. A brief qualitative evaluation is presented on some results of prediction as applied to various areas of microwave technology. A. K.

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Radar

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VOROB'YEV, YE. A.

"Radome Noise in the Presence of High Temperature Heating"

Kiev, Radioelektronika, Vol XIV, No 7, 1971, pp 839-840

Translation: Radome noise is considered under the assumption that the radome is a passive, well-matched receiving channel element with noise at the ambient temperature [1-3]. This method of evaluating the noise is reliable until the radome is subjected (for example, as a result of a counter aerodynamic flow) to high temperature heating. The noise level of the radome arising in this case, just as the other effects accompanying high temperature heating, is so significant that the real characteristics of the antenna and the entire radio system become sharply worse [4-7].

Analytical determination of the total noise temperature of the system made up of the heated radome and superhigh frequency antenna -- T_n(A + heat) is technically difficult and has low reliability since the majority of variables entering into the calculation formulas are complex functions of temperature, and they are defined by the structure and position of the antenna under the radome.

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VROB'YEV, YE. A., Radioelektronika, Vol XIV, No 7, 1971, pp 839-840

Still greater complexities arise when it is necessary to determine the partial components of the total noise temperature T_n^0(A + heat): for example, the outer heating surface, $T^0_{n.m.}$. Therefore, it is expedient to consider the noise introduced by the heated dielectric, $T^0_{n.d.}$ separately. Thus, the temperature component for the elementary solid angle Ω_i encompassing the element of volume of the dielectric can be represented in the form

$$T^0_{n.d.\Omega_i} \approx (1 - R^2_{\Omega_i}) \int_{r_1}^{r_2} \alpha_{\Omega_i} T^0_{\Omega_i} \exp\left[-\int_{r_1}^{r_2} \alpha_{\Omega_i} dr\right] dr + T^0_{n.m.}, \quad (1)$$

where α_{Ω_i} are the total losses in the element of material; R_{Ω_i} is the coefficient of reflection with respect to the field at the dielectric-air interface within the limits of the angle Ω_i, r_1 and r_2 are the distance from the antenna to the inner and outer surface of the dielectric, respectively. The values of R_{Ω_i} (T°) and α_{Ω_i} (T°) for a specific material are easily determined experimentally on

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